



Oral History of Gary Shapiro

Interviewed by:
John Hollar

Recorded: February 20, 2014
Mountain View, California

CHM Reference number: X7103.2014

© 2014 Computer History Museum

John Hollar: We're here with Gary Shapiro, president and CEO of the Consumer Electronics Association, for your oral history. Welcome.

Gary Shapiro: Thank you very much. It's a real honor to be here.

Hollar: It's great to have you here. Thanks. So let's start at the very beginning. I like for oral histories to begin with your upbringing and your education. Talk a little bit about where you were born, your mom and dad, the early influences in your life.

Shapiro: I was born in Long Island, New York, Wantagh, near Jones Beach. My mother was a Hebrew teacher who also sold World Book Encyclopedia, from Canada. And my father was an elementary schoolteacher, assistant principal, and principal. He grew up in New York City working in his parents' Broadway deli, a little store they owned. Their parents had come-- my mother's parents escaped Russia. It took them two tries, but they finally did it, and went to Montreal. And then didn't see their brothers and sisters for 50 years until they went back to Russia.

My father's parents escaped Romania and Poland where there was a history of anti-Semitism. And my grandmother worked in a hat factory in Manhattan, and she met my grandfather there, and they had two kids, and the rest is history.

But growing up on Long Island was great, because my father, being a schoolteacher, spent a lot of time with me. We went fishing, and swimming, and I had my own surfboard eventually. And I used to hitchhike to the beach. I was actually arrested for hitchhiking twice. And my father was very understanding, and never said that I shouldn't do it, never chided me. He'd just say, why didn't you ask me for a ride? Because he would always give me rides. And hitchhiking with a surfboard at that time, before the age of the cars we have today, which are bigger, you had to find someone basically who had a van which is very difficult. Usually a Volkswagen van. So I'd sometimes stand out there for an hour, hour and a half.

And I started out with a series of jobs actually. I started out very, very young, because my father was a schoolteacher, and I had three brothers, we didn't have a lot of money. And I started doing piecework. When I was six or seven years old, my father would bring home big foam structures from the factory and we'd punch out curlers, and we'd put them together, working as a family to get some money. And then of course I was always shoveling snow, mowing lawns, working since I was a very young kid. My telling moment for me was when I was about 15 years old, and my older brother was working for a temp agency. And he couldn't take a phone call that had come in, so I pretended I was him and I said I was of legal age, and I spent the day working in a lamp factory. And I basically did the same thing over and over again for a full day. And when my father picked me up at the end of the day I said, dad, I'm going to college. Because I never wanted to be stuck doing that work again. And that was a pivotal moment for me.

I started out as a dishwasher in a restaurant working from 5:00 to 2:00 in the morning, made \$20. It was great. And then moved on to other jobs, bus boy, waiter. Ended up managing a number of restaurants early on. The Jones Beach Theater, where Guy Lombardo performed every night was the big one, the theater restaurant there. And that, at the age of 20, actually got me a whole bunch of experience just managing people, solving problems, dealing with issues as they arose.

Hollar: That's a young age to be doing that.

Shapiro: Yes. I had to wear a suit. I borrowed my brother's suit. It was a learning experience, that's for sure. And I applied to a whole bunch of-- I didn't know what I wanted to be, but I always wanted to keep my options open. I did well. I went to Binghamton, a very respected, competitive, public institution in New York, a part of the State University of New York system. But I just wanted to do well there, because I wanted to keep my options open. I majored in economics and psychology, but while I was there I worked the whole time. I was a lifeguard. I was a house manager. I basically was there when different ethnic groups, and other groups-- the black student union, the Hispanics-- when they were having their parties, I'd run the sound boards and make sure that the event worked well. And I enjoyed it tremendously.

But I also raced through college. I graduated high school early because I wanted to go right to college. And I graduated college early because I figured out that, at that time, you could take as many credits as you wanted and it would cost the same. So I just maxed out on credits. And then when I was graduating college, I didn't know what I wanted to do. I had two majors, economics and psychology, and ended up working for summers in food service. And I was offered a full-time position in one of the largest food service companies in the United States. The training was going to be in Hawaii, and I almost did it. But I realized frankly that I was concerned with my own behavior, being a manager, working until late in the night, then going drinking with the employees. And that was when it wasn't frowned on in society at all to do that type of thing. But I realized.

Hollar: It was OK to do that.

Shapiro: It was OK to even drink on the job being the manager, because once everything is going, you just sit there and enjoy the open free bar essentially. And I realized that the direction I was going was I could have been an alcoholic. So I tried to reign that in about myself. And I had applied to law school, business, and graduate schools and got on a lot of waiting lists. And two days before the semester started very few, including Harvard, had rejected me. I was just on waiting lists. And I ended up being accepted at Georgetown, and I heard they had a beautiful campus. So I found myself, two or three days later, driving to Georgetown along with my father and a woman lawyer friend of ours. And I'll never forget, on the way to Washington from New York she told me the campus for the law school was different than the campus for the University. It was actually in a slum at the time. It's very disconcerting. I think I was the youngest person in my law school class at Georgetown.

Hollar: How old were you when you started law school?

Shapiro: I was 20. And I graduated at 23. It was 1980. So yeah, 23 years old.

Hollar: What did you do during law school in addition to going to law school? Did you continue having internships and working?

Shapiro: I needed money. So I didn't have this great career plan. Going to law school in Washington is an exceptional thing, I found out, because there's so many things to do. But right away, I needed money, and I went to work for a member of Congress. I didn't care what his political stripe was, I just needed a job. And it turned out to be a great career move.

Hollar: And was that Mickey Edwards?

Shapiro: Yes it was. Mickey Edwards was an expert on administrative law. He's a former FBI agent. But he's very conservative, from Oklahoma. And I was charged with responding to constituents. I learned that outside of-- there's a New York view of the world, and there's an Oklahoma view the world, and they're not parallel. New York is very liberal and Oklahoma is very conservative. But I learned a lot there, and I learned about administrative law. I helped write a new Administrative Procedures Act, which he was an expert on. And that got me another job the next year in a law firm.

Hollar: That was Squire Sanders. Is that right?

Shapiro: It was a predecessor to Squires. Nicholson Carr, and a bunch of former FTC lawyers and commissioners who had gotten together in this little boutique law firm. And it was very exciting, because by that point I was in my second year of law school and understood what the law was. And the clients there-- some of the clients were arbitrageurs on Wall Street. The game was, a merger would be announced and you'd have literally minutes to figure out whether it would be approved by a court or not, what barriers it would have to go through. So it required a lot of quick research.

Once it got to a judge, you had to figure out what the judge has said in the past. And there's a lot of all-nighters coming up with saying, this will go through or it won't go through. And Ivan Boesky was a client, and we were right all the time. And I learned that speed is important, and analysis is important. Being an antitrust lawyer then at the time, it certainly shaped some of my thinking.

Hollar: Did you like that area of the law immediately? Was that something you gravitated toward?

Shapiro: I just thought it was exciting. The adrenalin rush when you're proven right or not, some of the adversarial nature of it I enjoyed. I enjoy dealing with people. I learned, having worked in a member of Congress's office, that the phone is your valuable instrument. Not everything is a court filing or a regulatory filing. You have to deal with people as people and listen to them. And I also learned that brevity really is the soul of wit, that most people don't read very lengthy things. So if you can get something down to a short, compelling story and statement-- or as you learned in law school, to a one-sentence issue-- you'll go a long way. And a part of being a good lawyer is not knowing everything, but it's getting rid of the underbrush. Just coming up with the essential facts so people can make a decision.

Hollar: You hadn't been to Washington until you went to law school. Did you get the Washington bug by being there and working in Congress? Is it something that--- you found yourself saying, "I love this. I really want to stay in Washington and be around this."?

Shapiro: It was more gradual I think. But Washington is full of very, very smart people, and I like that. And there are serious issues which are discussed there. I have a problem sometimes when the only thing that matters are sports or something like that. There are big issues affecting the future of a lot of people, and even the world, that are being made in Washington. And no matter what your political persuasion or stripes, they are really smart people, and they care and they're passionate. And the debate that actually occurs there is-- I was about to say healthy, but right now at this moment in history it's not that healthy. But generally it's healthy, because if you can get the issues out, the facts on the table, and at least agree what the issues are, you can solve problems.

Hollar: Did you look to-- let me back up. So when you were practicing law, did that seem like a career path you wanted to pursue for a very long time? Or were you looking at other opportunities at the same time?

Shapiro: Well honestly, when I was younger, I always wanted to go to law school. I loved Perry Mason. I thought it would be so much fun. But the stumbling block was I never wanted to be a lawyer. I never had this great desire to be a lawyer. I just wanted to learn about the law. And my classmates in law school made fun of me because I really enjoyed law school. It was fashionable for everyone to hate it, and I just loved it. I just loved reading the cases. I loved the discussion. I just loved the intellectual nature of it. I don't like what it does to you as a person. I think the three-year process of law school is designed to dehumanize you in terms of an ethical sense. There's no right and wrong in law school. There's your client is right and the opposite party is wrong. And you see the world through your client's eyes and you convince yourself that you agree with them.

One thing I'm still very good at is--- I could take either side of a question and I could debate it. So the ethical nature of a human being is sucked out of you. And I think one of the reasons we have problems in America today is we have lawyers, and we have too many of them, they're increasingly unemployed, but

there's no law against filing lawsuits. And there's no great cost involved. So we have a phenomenal amount of litigation, and there's a litigation tax.

Honestly, I think we have to change as a society how we look at lawyers and the law. At that time in history, some of the smartest people went into law, which was a tragedy because lawyers generally aren't adding to the pie. They're just arguing over how it should be sliced and they take their little vig. And it's a tax we put on ourselves in this country. And hopefully if someone's watching this 100, 200 years of now, they'll figure out that we should go to a loser-pay system, there should be fewer lawyers, and that we shouldn't have a transaction tax the way we do now. Because it's one of the great barriers I think our society is facing. Not that lawyers personally are bad people. It's the process and that's their profession.

Hollar: And the way they're rewarded.

Shapiro: The way they're rewarded, absolutely.

Hollar: So what took you to CEA?

Shapiro: Well I got a job at the Nicholson and Carter law firm that merged into Squire, Sanders, and Dempsey. I was convinced to be a summer associate. And it was great after law school. And then they asked me to stay on as an associate. And frankly being a summer associate, as any lawyer will tell you, is a great job because everyone treats you well. I was also a law clerk there while going to law school, so I really knew that you're measured by the number of hours you bill. I found it difficult being an associate because, number one, '80, '81 was a recession. Companies were dramatically cutting back on their law firms, so it was tough to bill hours. And number two, I didn't like having to be responsive to every partner. I remember Fridays getting a phone call in the evening saying, "You have to come in tonight. There's this merger that we have to work on all weekend." I didn't feel I was in control of my life at all. And even some of the practices-- how you bill time-- I was not comfortable with. If you could come up with an answer in an hour or so it wasn't considered as good sometimes as if you could come up with it in four hours or so. Not just Squire, I'm talking about generally of law firms. When you're operating and selling your time by the hour, the incentive is not to do things quickly. I mean, Squire, Sanders was a great law firm, brilliant lawyers there, very ethical. But the practice law generally I think was one that I was questioning.

And so when I got the offer to go to a client, which I'd been working almost full time for anyhow, it was quite a wonderful offer for me. At that time the VCR was introduced, there was litigation against it, the Ninth Circuit Court of Appeals had held that the VCR was an illegal product because it was used for copyright infringement. And at that point we ran to the Supreme Court and they took the case. And they issued an opinion. They heard it twice actually. They put it over for one year, and in 1984 they issued a decision, the Sony Betamax case--- 5-4--- which said a VCR is legal because it has significant non-infringing uses, including recording over-the-air broadcast television. Along the way there, I was the

lawyer in charge of the association in the industry putting it all together. So I coordinated over 20 amici filings at the Supreme Court. I was, with others, the public face of this issue that technology should trump copyright law, that innovation is more important than the fact that the movie studio can't control when-- as they've always done throughout history-- when people watched their product.

And the movie studios, headed by--- now deceased--- and who was my friend by the time, the last several years of his life, even a mentor, was Jack Valenti, the most famous association executive. But I would debate Jack Valenti. I was on the Today Show, live, at the age of 26, debating George David Weiss, the famous songwriter, wrote Moon River. And I was doing debates around the country, if not the world, about how innovation is very important, the VCR should be legal, and just because the copyright-holders feel a loss of control doesn't mean a loss of income or opportunity. And in fact, the VCR--- of course as we know now, and even Valenti admitted they were wrong--- became the best friend Hollywood ever had, not "Jack the Ripper" as he described it.

But it wasn't only about the VCR, it was about audio recording as well. CDs had been introduced and the music industry hadn't gone to cassette tapes, so people were creating their own mixes with cassette tapes. And when the music industry did go around to cassette tapes, they did high speed. It wasn't very good. And so between debating Hollywood and debating the music industry, I wasn't making friends there in the creative community. In fact, they'd probably tell you even today that I'm not their best friend because I believe in innovation and where things can go, and you don't want to choke off new possibilities because some existing industry is out there very comfortably doing business their way. That's not what this country is about. That's not what innovation is about.

Hollar: Did you hang the argument on innovation from the very beginning?

Shapiro: Maybe I'm doing some revisionist history. Certainly it evolved that way. You don't want to choke off innovation when this is a great thing that allows consumers to take control of their own lives. You don't have to go to the movie theater, pay for the expensive popcorn, and get the babysitter. This is pro-family. We tried a lot of arguments.

And we had a lot of great debates, actually--- the Panasonic and the Sony lawyers, and others, and GE was involved, and 3M, and retailers. We had the best minds, I thought, on our team, including some real stars who've gone on to-- Ron Brown, he became Secretary of Commerce, was tragically killed, he was there representing a bunch of Japanese companies. As was David Rubenstein, who started the Carlyle Group, and one of the nation's biggest philanthropists. He's funding a lot of what's going on in Washington-- he's the number one philanthropist in Washington DC today.

But we were around there, and we'd have intense debates. We'd meet every week for hours. And I'd be running the meetings at the age of 26, and I counted--- there'd be 25 lawyers in that room. And I'd play,

how many billable-- what's the cost per hour to have this meeting? Tens of thousands of dollars. But it was worth it, because we were the new, young, nothing-to-lose people. But through the process of argument, we came up with great ways of approaching it. And whether innovation was part of it, I frankly don't remember. I like to think it was because that's all I talk about now.

Hollar: And what happened after the case was decided?

Shapiro: Well the Supreme Court--- there were numerous tracks actually. So you had the track of litigation, and the Supreme Court issued an opinion which was incredibly important. Before the opinion came out, when the Ninth Circuit issued their decision saying the VCR should be illegal, Congress immediately started the next week with legislation and hearings. I've probably testified at over a dozen hearings over the years on whether various recording products, products that capture things, should be legal or not. And that process went on for 30 years essentially, of various forms of legislation. Crazy proposals were made.

Along the way there were some things we did right and some things we did wrong. We didn't oppose legislation which made audio recordings non-rentable. My claim to fame in part was that video, the rental of video recordings was something I believed was critical. And I forced it on our group. And I remember there was a lot of opposition to it, including the Panasonic lawyer tried to get me fired because she was saying that those video retailers have nothing to do with us and it's all about time-shifting. And I said, no, it's about renting movies as well. It's going to be big. And that'll sell VCRs.

But there were a lot of different ways of approaching the issue. For example, one of the big things that the music industry did is: They came up with this rather insane system which would take a frequency notch out of music and basically require every recording device to be responsive to that missing notch. Foolishly on their part, it was something which was in the audible spectrum.

So we had someone who was a real expert listen to a lot of music and identify where it could really be audibly heard. And I think it was one of the wedding marches--. And we just played it in the congressional committee. And of course it was a revolution by music artists. They said, oh, don't corrupt my work. So the RIAA was humiliated by that, that thing that they were pushing, and it was moving through Congress. We basically had proven that it corrupted music.

So it was an exhilarating time because we were the new guys. We had the technology. And then the CD came along, and another recording-- the Internet was starting and people were arguing that the Internet is a massive illegal recording device. They argued that, under the copyright convention the US is a signatory to, you don't have to put a copyright notice, you don't have to do anything. If you create something original, it's copyrighted, it's automatic. The copyright notice has to do with the damages you are capable of getting.

So they were arguing that you cannot cut and paste from someone's email, you can't do anything. You can't send along someone's email. That's a copyright infringement. And technically they were right. We argued that no, that's not a reason to shut down the Internet. It's a fair use. And that was a Supreme Court decision as well, what fair use is. What is a fair use?

So fair use is the exception in the copyright laws, which says that despite the fact that the copyright owner owns every reproduction, transmission, there is this safety valve. And it's a defense to copyright infringement called fair use, and it's based on four factors. The length of the work. The commercial impact. What it's used for, is it used for education? Is it used for criticism or satire? And fair use was broader than the Sony Betamax case. It allowed a full recording of a full use of a movie on television. You could tape the Wizard of Oz on broadcast television for later use. And that was very disturbing to Hollywood and the broadcast world.

But they survived. They've prospered a million fold since then. Or at least 10 or 20 fold. And they've done very well, even though they had a lot of sky-is-falling arguments.

Hollar: What happened to the arc of your career after the Sony decision?

Shapiro: Well the Sony decision was very visible, so I was doing a lot of television, radio, news, debates, all around arguments, going around the country. I organized all the video retailers into an association, a national association, and they were our best allies, because you needed consumers, real people, to contact their members of Congress to let them know the VCR is important. But our strategy, our long-term strategy, we just have to keep the status quo of the products—that they are legal. Because once members of Congress at their salary range, could afford the product, we knew prices would come down and they would support us. Once they understood that these were not recording devices where you just put in a movie and make another movie, once they understood them and appreciated them, then we knew we were safe. Just as with other new technologies which come along.

When TiVo was first introduced, they had a competitor called Replay. Replay was sued out of existence by the movie and broadcasting industry, but TiVo survived, in part because some of the broadcasters had made an investment so they weren't the first to be sued, but in part because on the stage at the International CES, the chairman of the FCC, Michael Powell, when I asked him what product he liked, he responded immediately and he said, "TiVo, it's God's product." And we were walking off stage and he said, "I'm in big trouble for saying that." And I believed it. The Associated Press headline, I believe, was that quote.

Hollar: Right.

Shapiro: And they knew as an industry you can't try to make something illegal that people love.

Hollar: Right.

Shapiro: And now, even though there might be an arguable case against it, it's not being brought. Nor should it be brought because-- what's happened with technology is that technology is introduced, and you say, "Why do I need that?" Like the garage door opener which uses unlicensed spectrum. Like the cordless telephone. Or the microwave oven. These became necessities. So when you go into a hotel room today, if you don't have a flat screen-- a remote control for your TV set is another example—you are upset. You judge where you are by the technology that's there.

Hollar: A dock for your iPod.

Shapiro: Absolutely. So these things have become just accepted and important, and you can't take them away from people once they have them. It's like this passion on the gun-owner debate, on both sides, whether you should own guns. Well gun owners are passionate. That's why they're successful. And once you are used to having something, you should have it. So our products are pretty safe right now, except when we lose.

There is a law, which basically puts a royalty tax on audio recording equipment today. There's no real audio recording equipment because no one wants to pay that tax, so it's shifted over into the computer. And that's where the recording went. And that artificially changed the marketplace. We should never have agreed to that.

We never should have agreed also to the lengthening of the copyright term. Congress extended it over a 40-year period about a dozen times, and now it's almost perpetual. And it's been held that that's OK by the Supreme Court because the US Constitution says limited terms. And the Supreme Court's interpreted that to mean as long as one day less than forever, pretty much. So that has given the copyright owners-- they have gotten tremendous authority over it. And there's very little in the public the domain now because they use their lobbying forces to keep extending the copyright terms.

So instead of copyright terms being something to reward copyrighters for a short period of time and then the public benefits, now it's viewed as-- by the court and by Congress sadly because the copyright industry is a phenomenal giver to Congress in so many different ways-- it's virtually forever. The patents haven't gone that way.

Hollar: Have you seen this as a CEA issue? This lengthening of copyright?

Shapiro: I would now. I didn't then. I think because to introduce new products you need content. Content owners are reluctant usually, not always. The motion picture industry switched around. They work with us.

I worked on the DVD standard. We had a multi-industry effort. I remember negotiating with Jack Valenti and I agreed to a couple things I regret there. One of them was regional encoding. I thought that would be broken down for antitrust reasons. So you can't use your devices in Europe, and Asia, and US. They're encoded differently. They're built differently. There's different systems. That's a shame because a lot of people travel back and forth.

Hollar: Sure.

Shapiro: And the other one is, they wanted their piracy notice in there. So we agreed that the DVD players in generations would be built so you can't skip past the copyright notice. But what they've cleverly done-- which I find annoying-- is that they insert a lot of previews. So sometimes now you have to get through the previews before you get to the copyright notice, and your device will not let you skip through. It is what is. It was probably a mistake on our part. But generally, standardizing and having some copy protection in there, we did it voluntarily industry to industry, and it's worked out pretty well.

However, it's not all been perfect. But I think the historical results show that content has flourished. The Internet, movies, music, it's not-- the established companies have had mixed results, but new entrants have come into the market because of innovation and technology. And people are consuming more content than they ever have before.

Hollar: So let's get back to your career now. You're at CEA, the Sony decision has been issued. It's a big win. How did you see yourself at CEA at that point, and what happened in the subsequent few years?

Shapiro: Well we started out as the Radio Manufacturer's Association, became the TV and Radio Manufacturer's Association, and then broadened to the Electronic Industries Association. Through a series of corporate transformations we ended up as the Consumer Electronics Association. When I joined in the early '80s, it was really three products-- the radio, the television, and the turntable. CD was being introduced, the VCR was starting. All of a sudden, there was an explosion in products in different categories. CB radio had been big and went out, but radar detectors were coming.

Watches were all of a sudden being a mass-produced consumer item based on electronics. Calculators were huge. I bought my first calculator as a Father's Day gift with my brothers. And we chipped in. I think we spent \$400, which at the time was a huge expenditure.

Hollar: We probably have it downstairs.

Shapiro: Yeah. Probably. Now you open up a bank account and you get a free one. Calculators are a giveaway now. So many new products were being created. And I remember-- part of my job was to follow

legislation in states. And we'd go in on Saturday with a 300-baud modem and we'd wait several hours to download what states were doing. It was the slowest process in the world. But with progress, now it's almost immediate.

Hollar: Sure.

Shapiro: But basically the interface where we were was the interface with consumers and industries-- the phone industry, the cable industry, the motion picture industry, the music industry. And our job was to make sure that the policy world was not obstructing these things. And it took out a whole bunch of devices. For example, car navigational devices, which for navigationally challenged people, like myself, are essential. It's one of the most important products in my view, because I get lost a lot, even with devices. I went around to several states and I had to get them to change their laws so that you can watch TV as a driver, because they'd banned any video display. Well that video display was providing important information. Where you're going, that was important.

Also there were safety issues associated with our products, which became important. This was the early 1980s. The Sony Walkman had just been introduced. Some people wearing these things were getting killed on train tracks because they didn't hear the train coming. They were driving with them on. So part of it was a public education campaign. I remember the New York State Attorney General was I think threatening, or actually suing, a number of our companies. And I negotiated a deal with the Attorney General where every company would insert with their headset this little pamphlet. We agreed and fought over the language on them: "Use your head when you use your headset." Well, some companies are still using that language 30 years later because, in a way, that's an insurance policy against lawsuits.

Hollar: Was there a debate within the association at that point about what was a device or a company that should be a part of CEA's community?

Shapiro: Absolutely. So when I joined we had about 40 companies-- Zenith, RCA, and 3M, and Sony US, and Panasonic US, those US companies.

Hollar: Big companies.

Shapiro: Big companies. And when at the end of the '80s when I'd gone from being a lawyer to-- my predecessor moved on to a different job, I shifted in 1991 to take over the whole consumer electronics portion of what was then a larger organization-- I negotiated a little bit for the deal. I said, we can't just be an old boys club. If we want to be effective in Washington, what we have to do is we have to include smaller companies, startups, and go and be as broad as possible. Define consumer electronics broadly and even look at going after the distribution channel, meaning retailers.

Hollar: Had that been an issue in Congress for you up to that point? Were you hearing from people-- as you were doing your policy work-- you guys are just a big-company association?

Shapiro: Not only big companies. Jack Valenti and the music industry people would just say, "Oh, it's a bunch of foreign-owned companies," which wasn't true. There were definitely some, but they had US facilities, and Americans worked for them. But there were also a lot of US companies doing different things. So we were able to handle that debate. But most members of Congress do not live in big populated urban areas and they are not tech savvy. So they needed to hear from people in their districts and states. So we needed their constituents.

So if we got into Radio Shack, we'd have 4,000 stores across the United States reachable at the push of the button of the computer. I'd visited Radio Shack. I'd been in the CEO's office and he demonstrated the system. I wanted that. And I also wanted to define consumer electronics very broadly. And they agreed and they-- as boards evolved. It took a lot of internal debate. And we're still not quite there yet. But we've expanded so we're over 2,000 companies.

Hollar: Was there an aha moment for you at the early point of your career where you saw what CEA could be, beyond what it was that at that time?

Shapiro: It was the rush of excitement that there's potential in technology. Certainly going to digital with CD-- it was obvious to me that CD was better. Although there's still a debate in some segments whether digital music is better than analog music for a lot of reasons. But in video we knew it was going to happen. And I got very excited about the possibility of advanced television or high definition television.

I spent a lot of my career making sure that the US had a standard, and impediments were removed. And that was a battle with the broadcasters frankly. But we worked with them. And in Washington, what I've learned is cooperation is very important, even how we run our trade show. You go, you reach out to your competitors and your adversaries and you establish relationships so it's not personal. And you also learn about them and you partner with them when you can. So I was always one to partner.

For example, we would always invite as a matter of policy, even today, we invite our adversaries to speak at our meetings and give them a public stage so the public, the journalists and members of Congress can hear the debate. Because we're so convinced that we're right-- they're convinced they're right. The difference is they're representing a small constituency; we're representing the future. We're representing innovation. We're representing the possibility that you don't know about, and that is so important.

And I believe-- and my mother, the World Book Encyclopedia salesman-- and for those listening to this who don't know what that is, there was a time in history when everything was dead trees and paper, and all of knowledge was in these encyclopedias. And you would buy them for your home if you wanted to

step up your kids' education. My mother was passionate about the value of education and the value of encyclopedias. And she also told me, "You can't sell something if you're not passionate about it." I'm passionate about innovation. I'm passionate about the future. I'm passionate that innovation will change the definition of what problems are, whether it's in health care, in agriculture. In so many areas we have the tools. Right now we're in an exciting time because we're just putting them together to solve major problems.

The cost of health care for example is going to come down dramatically as we get more sophisticated in diagnosis, in costs, in telemedicine. There are so many things that are happening that are right right now. So my view is it's not the Consumer Electronics Association that is my passion and excitement, it's the potential and the future that's there that must be allowed to solve the world's problems and may not be held down by any particular industry because they have a lot of lobbyists in Washington, a lot of political influence. And that's what I believe in. That's why we created something called the Innovation Movement. That's the guiding theme around our membership.

The corporate members care about things that affect their companies. Of course they do. And we work on when there's a joint thing, that's what we work on. But really what we're focused on is the future of innovation, and we feel it's the essential gift to the next generation.

Hollar: Let's go back to HDTV for a minute. It's turned out to be a tremendous boon for broadcasters. Why did they oppose it so strongly in the beginning?

Shapiro: Well, from their point of view they were being forced to make an investment in new technology and buy all sorts of new equipment and not be able to charge any more for advertising, which was their source of revenue. Which is why they'll probably be the last ones to go over to ultra high definition 4K and then 8K. Because why should they make the investment? Because it's capital expense. It's money that's taken, no matter how you finance it, from your bottom line. So they were not in a rush. And they didn't see any competitive advantage.

It wasn't only broadcast. I remember a discussion with NBC's Bob Costas, talking about can we do the Olympics-- I think it was of '96 Olympics-- in HDTV? And how will the importance of HDTV be for sports? Because to me it was all sports and movies, that's all that mattered. And not only did he look at me like I was crazy, and respond that way, but when we asked NBC to do this we got a nasty letter from their lawyers saying we shouldn't even use their name. So we had a lot of trouble convincing broadcasters to go forward. Although we did eventually agree to help fund a model station and do the advanced television test center. And then we created something called the model station.

And the cable industry is always very easy to work with on some of these issues because they always were very strategic. They focused their future on how do we get pipelines into home and maximize the

value, whether it's entertainment or broadband connectivity. And their strategy they set 15 years ago is working. They're making a lot of money just from selling broadband connectivity to the home for Internet access.

Broadcasters, though-- they have a cash cow, and they have a lot of spectrum. They're also worried about giving up their spectrum. The challenge we face at this point in history is that there's not enough spectrum for what we need for wireless. And I give the Obama administration and the FCC a lot of credit for focusing on it, and Congress. I worked very hard along with a lot of others to make sure that Congress has allowed some various processes to go forward where hopefully we'll get some more spectrum from the government and from broadcasters.

Hollar: How did the arrival of the PC affect the association?

Shapiro: I remember one of the first things I lobbied on in Congress was to get, I think it was September, designated as computer learning month. And I did that in the early 1980s working with IBM and a couple others. And I was really proud of that achievement. Because to get a bill through Congress affirmatively and even if it was frankly as meaningless as that-- because it didn't change anything. Congress just declares a month. But it was satisfying to go office to office to get people to sign. So that was early on. That was the early days of the PC.

And then in 1991 I remember appearing in an IBM video news release talking about a chicken in every pot, a computer in every home because I was advocating that. The future is that everyone must have a computer. I certainly did not envision how it would transform into essentially your smartphone or your tablet. Although we did call the tablet market several years ago and we said, there's a lot of room-- our association pointed this out-- there's a lot of room for an intermediate device between the small screen of the telephone and the large screen of the television set.

Hollar: Was there another association that was trying to represent or make policy for personal computers or for companies who were primarily involved in computing as opposed to other types of electronics?

Shapiro: I think there's a number of associations which-- and there's increasingly more which use IT or Internet in their name. So these colleagues and friends work together on 99% of the issues. So there has always been a lot of associations. My view of that is that it's great. Sometimes the more signatures on a letter, or an ad, or any advocacy piece the bigger the group looks. But there's a free market essentially for associations.

In some countries, you must belong to an association, and they are the government-sanctioned ones. And in our country you could belong to anything you want. You don't have to belong to anything. So we pretty much own the consumer electronics portion, and we have all the IT companies that have anything

to interface with the consumer at all. So our prospect list at this point is pretty low in terms of gaining new members.

Hollar: You describe in your book, Ninja Innovation-- you talk about the strategy pivot that really changed the face of the consumer electronics show. Can you talk a bit-- now that CES and International CES® is such a juggernaut, the definitive show of its kind anywhere in the world, how did you envision that and move the association to get it to that point?

Shapiro: So when I took over the role in 1991, it was a recession. Comdex was the show. It had grown from almost nothing in the early '80s to the largest show in the country, if not the world.

Hollar: And that was really a computer-driven show.

Shapiro: Totally computer-driven. And I was the new [CEA] executive. And I remember saying to one of the board members, the head of Casio, John McDonald, I said, "It seems unfair that I'm heading this organization at a very difficult time." And he said, "Gary, an idiot could run anything in good times. It's in bad times when you really have to need smart people with moxie." And he's right, actually.

A lot of people in positions are lucky, including me frankly. I've ridden this wave for over 20, 30 years essentially of growth in technology and innovation. But it's when the rubber hits the road that you really have to work your hardest. And that's why a lot of people don't like the boom and bust cycle of economic recessions and things like that. They do really perform a cleansing operation and force people to innovate. Which I think has value.

It's painful on an individual basis. Anytime someone loses their job it's a painful experience. And that's what I view as my job. I approve every termination of any of our 150 employees because that's someone's life you're dealing with. And it's difficult. As I always tell my staff, it's better to be part of a growing organization than a shrinking one. So you want growth.

Comdex was coming on so strong that they were starting to go after our customers. Comdex was defining themselves as the largest not only IT show, but consumer electronics show.

Hollar: So they were trying to do the same pivot that you thought of.

Shapiro: Oh, they did. Panasonic took a bigger presence in Comdex than they did with us. And I asked them why. And they said, oh, they get more people than you. And I said, wow, well they're a public show.

They're open to anyone who wants to go. And we're a trade show. You have to be qualified to go to our show. It didn't matter. It was numbers. A lot of the Asian companies are numbers driven like that.

Hollar: What was the size of CES at that point? Average attendance?

Shapiro: Under 100,000, maybe 80,000, 90,000. But our strategy was first of all, we want to be honest in our numbers. So we're going to start something. We're going to get independent auditors to come in and say how many people were actually there, and what categories, and verify, and issue a statement. And whatever they say, we will follow. And we challenged Comdex to do the same. Comdex didn't do it. And when IBM pulled out of Comdex, that's what they gave-- according to The Wall Street Journal-- the reason they told the Journal was they [COMDEX] refused to audit their numbers.

We had a partnership with Comdex to do a second event, a spring event because both of our second events were dying at the time. And it was a clash of cultures. They were very focused on maximizing the dollar from each event rather than planning for the long term. And I remember sitting in the car in Las Vegas, driving with them. They were debating what number they would use for the number of people. And they said, let's do 225,000. No, we don't want-- it'll sound too big. People won't come. And a lot of show organizers do this.

It's very difficult to actually come up with precise numbers for attendance. Technology has made it a little easier, but still you don't know. And we also know a lot of people go to Las Vegas that never go to the show. They're visiting suites. They're doing things that are connected with the event.

Anyway the bottom line of it is-- our strategy was: Be honest. Treat your exhibitors well. Invest for the future heavily. They're going after us, we're going after them. And the pivotal thing was: we invited Bill Gates to speak, we invited Scott McNealy, Larry Ellison, and we got them all as speakers and we made the biggest deal about it.

Now the truth is when you go to events like us, and even Comdex, the percentage of attendees who attend these keynotes is under 10%, but they [the speakers] define what the show is about. So if we ever want to go to a future segment of an industry, we go after the leading company, the leading speaker, and we get them there. Bill Gates was interested in positioning Microsoft in consumer electronics. It was a great marriage, and he always drew a crowd from around the world. So we started being aggressive. We went into their turf, and we got the computer companies, and we just defined ourselves. And they were frankly focusing on the short term only, the bottom line, selling whoever bought would try to resell it. And they sold for \$880 million or so. And then it kept being sold for lower and lower amounts until it was \$1 for the name someone bought.

Hollar: And now it doesn't exist at all.

Shapiro: So we beat them essentially. They went out of business essentially.

Hollar: And you opened it to the public too. You opened CES to the public, which was--

Shapiro: We opened our dying show in Chicago to the public. So we had two shows each year. And the Chicago show was going away for a variety of reasons. One, it was badly timed. Two, there was nothing really new in product introductions for a while and it didn't fit the buying cycle. Chicago was considered a very difficult place to do business because of the union issues there. And it just was going down.

The Las Vegas show keeps going up, so eventually we transformed. To make a long story short, there's one mega show, and that's the International CES in January. And we keep redefining what consumer electronics is. So we went after Hollywood. We went after Wall Street. We decided that you could fit in a small room the number of retailers that mattered. So we had to go after other categories. We had to redefine. We have the auto industry now. We have growing health care. There are all sorts of new categories we see, whether it's robotics, nanotechnology, all sorts of new things happening very quickly.

Hollar: Over the course of this period, what's the most surprising trend you have seen? Is there something that just came out of nowhere and became huge and you thought, wow, that's really incredible?

Shapiro: Honestly nothing comes to mind that I was surprised about in a positive way. Because I am, if anything, more enthusiastic than I should be over some of the introductions. On the other hand, when categories of products have flopped, I have not been that surprised either. I've been wrong a couple of times. Perhaps my most embarrassing mistake was, Microsoft had a product introduction at our show, and I was at the rehearsal. I was the only non-Microsoft person in the room. And because I do a lot of these things I had some very specific suggestions about how they were presenting it, what they say, their pace.

And I talked to one of the Microsoft people, and they looked at me very nervously and said, you should just tell that directly to Bill. So I went and I talked to Bill Gates, and he actually listened and eventually incorporated most of what I suggested. But what I did foolishly say-- that I think this introduction has to be one of the most significant introductions in history. It was Microsoft's dancing paper clip which was mandatory. And you couldn't remove it from your screen, and it became one of the most annoying things. It was called Bob. And actually, ironically, it was the brainchild or at least the adopted child of then I think it was Bill's fiancé at the time. Maybe it was his wife. And so no one would tell Bill that it wasn't a good idea. And I foolishly said, this is a great idea, and I'm embarrassed.

I don't know why my biggest mistake is what I choose to share.

But the lesson for me there was, number one, I may not be the best at picking the products after just watching one rehearsal for a product introduction, and number two, the bigger lesson was-- as the CEO of a company, Bill Gates should not have, given his relationship with that woman-- it was her project, no one wanted to criticize it. And what makes a great company versus a good company is the diversity of thought, the ability to actually confront the leader if you think the leader is wrong. And I don't think that occurred in that case. I think that everyone was scared about pillow talk.

And that's not how you should hire people or manage a company. And I've been very sensitive about that in my own company. And I see companies. I see family owned businesses. I see how you make decisions. And you have to be very careful that you're getting-- and I even see a lot of the Asian companies don't have that diversity of thought. They just are dealing with consensus and following the party line, and that doesn't lead to good decision-making.

Hollar: Let's talk a little bit about what it's like to work with Congress. What it's been like and what it's like today. So first of all, talk a just a bit about your philosophy, of how you lead an organization like this to work with Congress to get things done.

Shapiro: I think in dealing with Congress you have to recognize, first of all, they're all human beings. And one of the lessons my brother taught me in life is that humans share a common bond. They care number one about their family. They're excited about it. They're passionate about it. And if you can relate to them as human beings, essentially your relationships start and results follow. So in dealing with them-- whether it's Congress, or dealing with potential customers, or anyone-- you have to establish a human link. You just can't have a great case and hand someone a piece of paper and expect them to agree with you. So relationships are important, which is why there are so many lobbyists in Washington-- it's not just about the money and the financial contributions. There are people there who have relationships so that the ears will be open because they trust that person. So that's number one.

Number two, you have to have some principles. So one of the principles our organization has, which I'm pretty proud of, is we've never asked Congress for money. We believe in the power of innovation, and that's what must be protected. We're not one of the 10,000 industries in Washington with their lobbyists who are saying, give us a piece. We don't even support the R&D tax credit, even though a lot of our sister associations do, a lot of our company members do. As a position, we don't oppose it, but we don't advocate for it. So we've never advocated for everything.

Even during that high definition television transformation, I had a member of Congress who was so angry with me because they were trying to give our industry essentially billions of dollars in the form of coupons that they could turn in at retail to buy converter boxes for the transition and I refused to support it on behalf of our organization, our industry. And he couldn't understand that. And I said, we have a principle that we don't ask the government for money. And sometimes I have to deal with our industry members one on one to make sure they understand. In the long term you have to be principled.

Third thing is you have to have a history of being right. So I think part of arguing any case is acknowledging and confronting the weaknesses in your argument, rather than having a member of Congress learn about it from the other side. Then the member of Congress feels you haven't been truthful. So whether it's a debate with anyone, or I'm talking to a member of Congress, I point out what the other side is saying and say why we disagree with it. You have to have your facts. You have to have a history of credibility. And you have to be right. So the challenge I face, the toughest challenges, I don't want to say the sky is falling, because I think you lose credibility that way. But sometimes I don't know if the sky is falling because I don't know what area of innovation will be choked off.

So that's why, when Congress is about to act like they-- real groundbreaking historic action by our world was a couple years ago with SOPA, PIPA debate where the content world, the music industry, the motion picture industry, were pushing through Congress legislation which would allow anyone to shut down a new company on the internet by claiming a copyright infringement. They could shut down a website just with a claim. And we said this is crazy. Let's work together. Let's change it. We understand that this pirated product shouldn't be sold. Let's talk about a solution. They said, we don't need you. They wouldn't talk to us. They got it through the Senate Judiciary Committee unanimously. It was very embarrassing. We were the only ones out there fighting early.

And fortunately for us, we got Darrell Issa-- a member of Congress, who was the former chairman of our board-- he stood up on this. And the first time he stood up for us on an issue. He'd been in Congress for 10 years and he stood up and took a position, as did a Democrat in the Senate. From Oregon, Senator Ron Wyden. And they held a press conference at 2013 CES. And we got on board Wikipedia and all the Internet companies. And a lot of them shut down their sites for a day.

Hollar: I remember that. That was incredibly effective.

Shapiro: Five million constituents contacted their members of Congress that week. And within 24 hours, members of Congress had pulled their name off the legislation and it died. It was the most effective, time-shrunk event in American history in terms of contacting Congress. And they're scared now, of the tech industry, in part because of that. It hasn't stopped them because there's literally hundreds of lobbyists trying to preserve their position for either the motion picture industry, the music industry, or whatever. So we're still fighting battles every day. And if they don't win with Congress, they do things with the Administration. They'll put it into a treaty. They'll do it behind closed doors. I feel like we're playing whack-a-mole all the time, trying to get down what's popped up.

And I feel we've been right. I feel we've been right because the technology industry has changed the world. Because in the US, we have a very unique approach. Yes, we're up against the biggest lobbies anywhere in the world, and they are difficult to beat. But we don't have to beat them; we just have to slow them down so they can't get what they want. Because it's tough to get something through Congress. But

what we have here is unique. We have Silicon Valley and other areas of the country. We have an immigrant culture. The most diverse country in the world, which is a lot of different points of view.

Despite what people lament about our educational system, some of which is true and of concern, we have kids we train to ask the question "Why?" Or "why not?" They're not great at memorizing by rote, but they're learning. We have the First Amendment, which protects us. So someone with a new idea comes, they can express it and government just can't shut them down without some process, whether by Congress or a court. Even though they're competition, the old status quo guys are trying to kill them, whether it's an Uber with a new taxi service-- which we support and are a member of ours-- or an Aereo, which is the current litigation right now. We go out and we gather in the little guys that are new because we believe in the little guy having a chance. Even if it hurts someone's business model, as long as it's ethical, honest, and there's a good case for it they should be allowed to change things. Because we're a nation that changes.

So we have a lot of the ingredients. And here we still have winners and losers. And losing isn't a bad thing because you learn something. The only culture in the world, except for Israel, where failing is OK. And it's a good thing.

So you take our great university system, our culture of being a-- basically we all descend from immigrants--- other than Native American Indians, and slaves---from people who came here for a better life. And it's our culture that we come from people that want a better life. We ask why not? Why can't I do better? Come up with a way of doing things better. And that's what encouraged. And I think that's our asset as a nation. And that's what we fight for.

That's why we have the innovation movement. That's why we're fighting. Everything so that future generation of Americans, and even the world, will benefit from what we have here. We're not going to compete on the basis of having the lowest cost factories in the world. We just can't. We're too highly educated and we're too restless. So that is what we've been fighting for for the last several years, and it's what we believe in. And that's when I, Mina, and the people who work at CEA come to work every morning is for the cause of innovation because we believe in it.

Hollar: You remarked earlier about the difficulty in Congress now. Not the difficulty of CEA working with Congress, just the atmosphere of trying to get things done in Washington. Why has that happened and how will that change?

Shapiro: It's multi-factorial. There's a lot of reasons. When I was growing up, we were unified by what we hated. We hated the Soviet Union and we feared them. And that drove us into space, it drew our technology, drew us to build better computers. We had to beat the Soviets. They were threatening our lives. And we hated them. And that unified the country.

Our country was unified when Kennedy was killed, during the Challenger disaster, during September 11th. We came together as a country, and we believed things, and we got things done in Washington after each of those times because we felt something together. Sadly, what we have now is we have turned on ourselves. The Republicans and the Democrats, the conservatives and the liberals really hate each other.

The Internet is phenomenal, and it's great. But the challenge is there's a lot of unfiltered content. And you realize the depth of the hatred when you read the liberals in the Huffington Post on the one hand, and how they all seem to agree and they hate conservatives, and then you read what the conservatives write on American Spectator or other conservative blogs, and they both are haters. And I think we are in a period of time where our parties are living off this hate and encouraging it. And we lack leadership of togetherness. We're all in this together.

Take something as basic as health care. I feel lousy now. I have a bad cold I think. And I hope, in the future whoever's watching this that you've solved that problem. But no one in America should suffer from a health care problem. We could have gotten Republicans and Democrats to agree that Americans have a right to health care to the extent it's out there. And once you define that and say, how do we do that together? And define the issue, which is the issue, how do you make sure Americans get health care? And then you say, well what are the facts? How do we get there? We could have had a discussion and a debate. We didn't have it. We had one party force something that close to half of Americans didn't want. And it's drowned us for four years now, and probably will drown us in the future for a long time, because we're forcing things on each other rather than having a discussion where we solve problems.

So other people talk about the influence of money-- and it's all true-- and lobbyists. And that's all true. But we have divided ourselves into two opposing camps. I'm proud that I've become affiliated with a group called No Labels, which has gathered almost 100 members of Congress. And they say, it's not Republicans. It's not Democrats. It's let's solve problems together. Let's talk about it as Americans. Put your fellow citizens over your party. Having parties to me is kind of absurd anyhow.

Hollar: Will the change that's needed to try to get more of a problem-solving attitude in Congress come through that kind of movement?

Shapiro: It will come through this movement or something connected in the future. Movements are sometimes intense. To me, the movement really should be about the fact that the next generation and generations beyond are totally getting killed by this generation. Our generation has promised ourselves something we can't possibly deliver. Whether it's social security, Medicare, Medicaid, we have a number. Numbers don't lie. It's the absolute science in the world of math and physics where there are immutable things that occur.

So you can't build up this phenomenal debt, these phenomenal promises and not raise taxes dramatically. Or even if you did, we can't do it all. So we have to make tough decisions. It's a mathematical certainty. And I'm talking to a point where there's 0% interest rates. Interest rates go up to normally almost 5%. 5% on a \$20, \$25 trillion debt, you're talking about spending literally trillions of dollars to just service the debt. That leaves nothing for defense, or education, or health care. So we are in trouble. And my only frustration today is where is the generation that is getting hurt by this? Why are we the greedy geezers taking away their future so that all they're going to have is debt? So I believe at some point they'll figure it out. I think the challenge is they're very focused on their present job or getting through school.

But the movement that I grew up with was the anti-Vietnam War movement, which is really a movement of youth that believed passionately that that war was wrong and un-winnable. And whether or not they were right or wrong-- I remember arguing, wearing a black armband to school and getting beat up for it. I remember my father saying the war was necessary because of the domino theory of the Vietnam War. But eventually he was convinced, and I think history has shown that the youth were right then. But since then, there's been no youth movement that I'm aware of in any significant way.

There's generational theft, which is occurring today. And Republicans and Democrats-- Republicans maybe less so because they are focused on the deficit-- there's just a refusal to address the toughest problem. So even if you talk about something as minor as cutting postal service on a Saturday, or adjusting the cost of living for Social Security, you have literally millions of people saying my right to this has been taken away from me. And it's a failure of political leadership, it's a failure of leadership in our country. And it kills me to witness our failure to act.

And one of the reasons I'm passionate about it is because-- to get personal-- I got married again fairly late in life when I was approaching 50. And my wife, although younger than me, we thought was past childbearing age. And after a few years of marriage she got pregnant. And all of a sudden I was confronted with the fact that, as we decided to go forward have the baby, which was a very difficult decision, that we were bringing somebody into the world who will be there for a long time when we won't be. We won't be there, around for most of his life because I'm 57 now and it's sad, but I'm not going to be there for most of my son's life by the way, so I have a five and 1/2 year-old now. And so all of a sudden it became a very personal issue for me, that there's this kid, I'm not going to be around, and he's inheriting something which I helped create. So it became very personal.

I have a platform. I have a board that, thankfully, is as passionate as I am about this. They believe the most important thing for the future health of our industry is the future health of the American economy. And they felt-- and we all agreed-- that the American economy is in trouble because our government leaders are not make good decisions about how they're spending. And they're not confronting the reality of a certain future of numbers. So we believe, together, that you have three choices. You can raise taxes, you can cut spending, or you can grow. And growth comes from innovation.

So we've advocated for higher taxes. We're the only organization probably in Washington that does. Lower spending. We supported the Bipartisan Deficit Commission findings. I think we're only association that has. But where we have more control, and we have a lot more input, is growth, growth coming from innovation. So we fight for innovation, because innovation is where the jobs, where the culture is going, and everything else.

So I have this now almost six-year-old son, and every day I look at him and see him, it's like, what kind of future will you have when I'm gone? And I owe him something. Shockingly enough though, a few years later my wife got pregnant again. And now I have a one and 1/2 year-old. And these issues are even more important.

My wife's a retina surgeon, and we've kind of figured out how babies are made at this point, but having young children at a later stage in life is a very different experience. I have two kids in their late 20s now. They're pretty much on their own. They're set. They know what they're going to do. When they were raised, I didn't think about it at all. I didn't think about the far future or that their lives would be-- I was just raising the kids, and always tired, and trying to focus on my job. But now my job and my personal promise, in a sense, to my children, my younger children, have collided in a happy way.

Hollar: That's great. Let's talk a little bit about the future. I have a question here that you may need to reflect on for a minute. But you've observed so much about consumer attitudes over the time that you've been with the association and seeing the things that catch on within International CES or don't. Can you sum up what you've learned about the attitudes of consumers, especially American consumers, based on what you've seen? And is that different in other parts of the world?

Shapiro: Well Americans always want the best. So during the high definition television debate for example, there was a few different ways we could have gone. Japan started out with the first high definition system. It was analog. And they had to recall over 100,000 TV sets as they saw this breakthrough that occurred in the United States going to digital.

Europe was convinced there was a two-step system. In fact, the first time I went overseas in my life was a business trip to France to speak at a conference about high definition television. And I said as polite as I could that they were wrong, that they have to go for the best system possible because their consumers will demand it. And that is indeed what happened. They started with a system in Europe that was sub par, and consumers essentially went to the satellite companies and bought the big HDTV sets because they wanted it. And satellite started killing broadcasting. And they quickly abandoned what they were doing and went to a full high definition television.

In the US, there was a battle that went on between those who wanted a cheaper way of doing things. And Fox broadcasting was one of the leaders. They thought 480 progressive was good enough.

Hollar: I remember that.

Shapiro: And there were those that-- a large group of us who were passionate we had to give the best possible system to Americans. That's why we created the advanced television test center. And I was the only non-broadcaster in the room there at these meetings. And to me it was like there were some people who were focused on the process. There's 23 systems that were tested there, and if a component broke, they said, too bad, so sad. You go home. You've lost. Your results stink. And I was like no. We're creating the new system of television, the future. A component breaking down in a test is not disqualifying. You have to give them a chance. We want the best system. And eventually, we did come up with the best system. It was unique in the world. And it's worked for the American topography and geography, which is very widespread. As opposed to Japan, which is very concentrated and where you can reach everyone with one satellite. So we did what was best.

The Japanese went to mobile products, as did Europe a lot quicker and faster. Mobile meaning mobile video, which never took off-- well it hasn't at this point in time. Mobile television has not taken off.

So Americans are different. We demand the best. And we want choice. Japanese are much more technically oriented though. They look at the specs more. Americans look at the specs less. Americans are value conscious, but also very, very brand conscious. And that changes. We have the Vizios, and the Gateways, and-- even the Dells will offer a product more on price than on the strength of their brand. So we're always changing who the brand leaders are. And some company's strategy is focused on price. Some company's strategy is focused on brand.

But Americans still are the ones that are defining the market for the future in terms of where products are introduced, whether they take off. Number one, the size and wealth of the market. And number two, historically we get product introductions because of our history as leaders. Certainly Europe had us beat for a while in wireless technology. That is dramatically changed, in part because of Verizon, and AT&T, and others have made huge investments here. We've leapfrogged them into 4G, and broadband services, Wi-Fi. So in terms of the American psyche, I think they're willing to experiment. I think we have a love affair with our gadgets. The average American home has about 25 of them. And they like the new thing.

Hollar: Where do you think Silicon Valley fits in the whole panorama of the future?

Shapiro: Silicon Valley is definitely the center of the world in terms of innovation. It's undisputed. There's no question about that. You could measure it by patents, VC money, companies, job growth, whatever measure you want to use; I think Silicon Valley will come out on top. But having traveled the world talking about innovation and writing about it, there are pockets of innovation almost everywhere I've been, whether it's been in Warsaw or Seattle, Boston or Maryland, or northern Virginia where I sit on the Northern Virginia Tech Council Board. There's over 1,000 companies there.

And what I think areas have in common-- and even Paris now, France is doing very well in innovation-- every geographic area has strengths and weaknesses. Silicon Valley is great. Phenomenal university, cultural innovation, phenomenal financing. It's here. Willingness to take risks. On the other hand, negatives, it's pretty expensive here. And that's a barrier for a lot of startups. And Silicon Valley is not the home to most people in the world. And people like to start things, and they like their families, and they like to stay near their homes.

So there are other areas. For example, biomedical. Really good in San Diego. Really good in Maryland. There's clusters, either because of government investment-- for example, take the defense industry. In the Washington area, tremendous benefits because of that. In other areas on the West Coast, great benefits.

Take Israel. I think Israel is actually more innovative, if you define it by patents per person, than anywhere in the world. Why? Multi-factoral. They're risk takers. When you're facing death every day by people surrounding, taking a business risk is not a big deal. They're question askers. They're naturally curious. They're serious. They have a mandatory draft for everyone. So you've had that shared common experience, you have a mission, you believe in the defense industry. Oh, and the defense industry investment of course is huge there, and with spillover effects.

So every area has strengths and weaknesses, and my advice to those that have any specific geographical area is figure out what they are and play off your strengths. Of course you could try to build off your weaknesses, but it's tough to strengthen a weakness. Same thing with people. You're going to be successful as an individual if you know yourself, if you have the emotional intelligence so you know what you're good at and you know what you're bad at.

Anyone who does employee reviews know that the way they usually work is you tell them how good they are in a few sentences, then spend the rest of your time talking about what they need improvement on. Well the truth is, what they need improvement on, especially at the senior levels, is not something they're going to be able to change. So what you have to talk about is how you can complement them with people that will match their weaknesses. If you look at some of the great Silicon Valley success stories-- like even with Steve Jobs. It wasn't just Steve Jobs. Wozniak was the technical guy. He complemented Steve. Anyone, even Thomas Edison, although he had a lot of patents, wasn't going it alone. He had a lot of partners there. Hundreds of engineers in creating things.

Hollar: Where do you think-- is there one part of the world where you think the next big opportunities are going to come from? Is it Israel? Is it somewhere else that you've seen that you're intrigued with now?

Shapiro: Well for example, let's take France. France is a great country with a great history and it's focused on the senses. The food tastes and smells good. The wine is just great. The perfumes you can

smell. The materials for the styles, visually how the French dress in Paris, it's just a beautiful, romantic, enchanting experience. And it's something which-- that's their strength. How do they play off that? How do they shift to the next level of technology? And they're working on it. And they're doing a good job on it.

Israel certainly, as we discussed, has so many things going for it, but their weakness is they have no market, domestic market to sell. It's tiny and they're surrounded by hostility. So they have to work on relationships and somehow solving the quagmire that we've all lived through all our lives.

So what area of the world am I excited about? I think Europe generally has not met its potential. And if you think about what we have in America, we have the world's best movie industry, music industry, biotech; obviously every Internet name is an American company one way or another. Whether it's Google, or Yahoo, or eBay, or Amazon, or Twitter, or Wikipedia, they're American companies. Why have we dominated the Internet? Or chips. Qualcomm, Intel, others.

So we have it here, and that builds on itself after a while because you have critical mass in an area with education. And we also had the people who wanted to come here from around the world. The best and the brightest. We've switched around on that. It's one of the issues we're working on. How do we make sure we can keep those PhDs that we're training in STEM? 70% percent of them are foreign and then we send them back home. It's starting to hurt our defense industry. We've got to change that. But in terms of area of the world, Israel, the US, parts of France, Eastern Europe has a lot of promise because they're scrappy, they're hungry, they're smart. India clearly in some ways, but they have challenges in infrastructure and poverty. Russia has potential if it can get over its corrupt system. And obviously its present leadership is pretty anti-human rights.

And then of course there's China. And I have strong feelings about China. My five-year-old is fluent in Mandarin because my wife believes China is the future. We have Chinese nannies that live with us and school him. And they're not allowed to speak English to him. But China is a country with different values than the US. We value private property and exploiting it, and intellectual property. China has a different attitude. And there's a culture clash there. And there's a political leadership which is protecting itself. There's a huge problem with corruption in China.

And they have as a national policy that they want to follow us, be like us. They've proven they're the world's manufacturer, but they don't want to be that. They want to be the world's innovator, as does every country I go to. But they have a 10-year plan. That 10-year plan is based on a number of patents per 10,000 people. They have specific goals. They try to recruit and repatriate Chinese who have come here. They have a system. They have, at this time we're speaking, 200,000 students in the US today from China, increasingly at younger ages, because they've figured out that they're copiers. They're not innovators. So they realize they've got to change that culturally. They got to get the kids US trained while they're young, and then have them come back to China. And sadly the US is standing by and letting all

this happen. We're so free market oriented in a way, we don't care if people steal the people that we educate. We push them out.

Hollar: What do you think about China's strategy?

Shapiro: I think the concern that I have is the Chinese leadership's primary concern is the Chinese leadership. So they'll do anything to keep their power. Which means obviously they restrict access to the Internet. They restrict free discussion, which restricts creativity. I think the most creative people in the world don't want to be restricted. They want to know they could talk to anyone without the fear that the governments going to come down if they say something they disagree with.

China has weaknesses in it. Until recently, they've had a pretty strict one-child policy. So every child has six people that are doting on them, the parents and the grandparents. So those six people focusing on one kid-- some people in China say it's a spoiled child generation, and I think there's some truth to that. And so the hours of work, the work ethic, the ability to create and innovate when everything's been handed to you, it's a fear a lot of us that are successful in the US have feared for our own children. If you're successful, how can your children be hungry enough to try to succeed on their own?

I heard the woman who heads-- until recently-- British Aerospace. She gave a speech recently, and she said in a question and answer period something which struck me and got audience applause. She said she had given advice to her child which was mistaken. Is it go to any school you want, major in anything you want. And that's still the attitude of parents here in the US. She said, I should have said, major in something that will get you a job, and then if you want to pursue your life's dreams, go ahead. And we've done that now as a generation.

So for example, our strategy today is nonexistent in innovation. Our strategy is you throw it government money, give it the R&D tax credit, and we're going to be an innovative country. At the same time we're restricting immigration, we're not getting the best and the brightest anymore. When we do get the best, smart people to come to our universities and we spend \$6 billion a year on them with National Science Foundation money, we kick them out. And as parents, we encourage our kids to study things like art history, which can't get them jobs. It doesn't make sense.

And our government is giving away-- pushing money on kids so they get out in such debt they won't have jobs and they can't afford to pay it. And they promiscuously give away money so that an art history major and a mathematics major get the same loan at the same interest rate. So we have a shortage of qualified people for many jobs. And we, culturally, have a lack of respect for those that are in skilled labor. So if there are electricians, or there are computer programmers, or something like that and they get a two year degree from a community college we looked down at them. So every parent's dream is for their children to get a degree from a four-year college. It's insanity.

So we're on a path which I think is very dangerous because we're not addressing our big problems financially. We're not addressing our human capital problems. We have a shortage of workers. And we're increasingly relying on the rest of the world to do our stuff. So all we'll have left is our ability to innovate. And that's why we have to focus on innovation.

We also have to address these other areas. Whether it's through creating apprenticeship programs, or changing our educational structure, or allowing more free market education to occur, or just leadership at the top. Whoever is President of the United States has an obligation to unite us and not divide us, not create enemies from within. And also to talk about the biggest problems and how we address them. The reality that parents have a job, communities have a job, Americans have a job, and our job is to raise the next generation, give them a life better than our own. And I don't think there's even a discussion or awareness of that now at our top leadership level, whether it be Democrat or Republican.

Hollar: That's really a great lead-in to my final question, which I ask everybody, and that's: If you were giving someone who's young, older than your children, but still looking to plan their career or their future, and if they were thinking about technology in particular, what advice would you give them?

Shapiro: Well I actually have two books out. And the first book is some significant advice. And I was thrilled by the fact that when my second book came out, a lot of people who had bought the first book had given it to their children. And I got a lot of stories coming about, for example, you influenced my kid to go get their PhD in math. A lot of advanced education and hard science, and also start a business. A lot of people said, I started a business because of what I read that you wrote. So my advice is very transparent.

It is true that when you're younger you can take risks. You can start something. My advice is don't be afraid to fail. Failure is an opportunity to learn. You don't learn when you succeed. You just think you're smart. And you think you're doing things right. In truth you're very lucky. And you might have randomly made a good decision, and you might be in some ways smart, but you have to fail to succeed. And that's the lesson of American that I think we share as a country compared to others where if you fail you're out of it in most cultures.

The second thing is yes, be passionate about what you're doing and study, but be realistic as well. You need to get a job. Whether you create a job for yourself or you go into something where there's demand. But you have to be realistic. I hate to use art history as an example again. But studying history, it's not that there's not a great opportunity in a computer history museum, and history is incredibly important, but it's difficult to get a job if you're a history major. And having said that, my oldest son has a degree, a master's degree no less, in the history of science and technology and he's having a tough time. And so I'm seeing it first hand.

But as parents you have an obligation to your kids. The number one obligation is to instill confidence in them. If you've done that, you're 90% there as parents. Obviously the other 10% is pretty big. I mean, ethics is probably more than 50%. You have to instill that. But you have to instill enough confidence that they can take failure and move on. And that's one thing I think culturally we're pretty good at, but it's this thing of study whatever you want and don't worry what will happen is not realistic anymore. We need people who can fix cars. We need people who can do different things. So get a marketable skill and then pursue your passion.

And also consider other areas outside of where you live. Consider Washington for example. It's a great area because there's a lot of smart people that are trying to solve big problems. So there's a lot of different areas you should go to. And usually advice is more customized. And I have found that one of the things I learned is the best way you sell something is by asking questions and figuring out what the person's challenges, desires, goals are. And then you can answer the question of what advice you can give them. You just can't start selling the way you'd sell a car. This car is great. You want to know what they're going to drive for, what they use it for, do they envision kids in it or not? That's how you sell a car, if you're good at it. If you're not, you just start selling the car.

Hollar: You and the president are pretty hard on art historians. Or art history majors.

Shapiro: No. I'm sorry. I realize midway that I'm sitting here in this wonderful tribute to the history of technology, and it's incredibly important. But it is the reality also; of course we must study history. But we can only have so many people who study it. I don't want to be politically incorrect in talking about the history of any particular race, or religion, or sex. Because there are a lot of people who major in that and then they're befuddled why they can't get a job.

On the other hand, if you study, for example, English or another foreign language and you became a great writer, there's a tremendous demand for writers. Not as much as some journalists would like. But people who can put a sentence together, people who can work on a team, people who are empathetic, people who have skills in diverse areas who see the picture. I tell my own employees, here's how you succeed. You don't just think about your job. You think about the organization. You do a lot of things. One of the things you do is get outside your job. Go to other industries, other groups, volunteer. And creativity is the ability to put different thoughts together in a novel way that will have some value. Make something happen essentially, is what it's saying. Do something and show us that you're seeing the forest. And that's something Americans are pretty good at.

So I have no problems with people in art history. I think it's great. I know art history majors. And I'm sorry, I could come up with other majors. There are a lot of majors out there. And of course, there's a lobby of people who teach each major who get very upset any time someone implies their subject is not important. And the challenge we face in our country is we do not have the political will or leadership to say look, this

is what's important and this is what's not important. Whereas before when we had a shortage of nurses and other specialists, we could create special scholarships.

Now our strategy is we just throw money at kids, force them to take full scholarships and they owe-- at this point-- a trillion dollars in debt. The next big battle may be forgive the debt, which is absurd, but that's where we're heading. I think we're at a critical point. You always think you're at a critical point in history when you're talking at that moment in time, that you're sharing with everyone else, because this is the most important game of the season if you will. Because we're clearly on a precipice as a nation, financially, morally, ethically. And as we talk through these huge issues of privacy, government monitoring, what government can do, our role by reputation is suffering. We've hurt our allies by monitoring their conversations. We're viewed as not caring about people's privacy.

There's a lack of moral leadership. There's a tremendous number of wars in the world, and revolutions which we have no say over. We're making some bad decisions. We have a Congress and a President which can't work together. And even a Congress which can't work together. And we hate each other. And it's a bad moment.

Despite that, our stock market is doing well. We're the prettiest of seven ugly sisters. We're doing OK as a country. But thinking five, 10, 15, 20, 30, 50, 100 years out, what are we doing? Well we are heading towards certain things that are certain. We're heading towards driver-less cars which will solve a lot of our health problems, and also in terms of fatal accidents. But will cause a lot of other problems. What happens to the insurance companies? What happens to the emergency doctors? What happens to the towing specialists, the fender-bender fixers, and everyone else who lives off the fact that people have car accidents? What happens to all those drivers who drive all those taxis, and trucks, and cars? On the other hand, that will free up productive time in cars in a very safe way.

We're heading towards situations where we have technology coming which will change us. We have technology change occurring which is huge today. It's not only driver-less cars which we are heading towards. 3D printing is a wonderful thing. New ways of delivering things to the home, or transporting, or testing, or experimenting, or checking your fields through drones is huge. In the future maybe you'll have three ways of getting something you want. You'll create it yourself in your home with a 3D printer that could use various componentry or molecular level inputs. You could have it delivered by a drone to your house. Or you could have a driver-less car that will drop it off. There's so many choices of doing things. And there will be other ways. Or maybe it will be the Star Trek teleporter thing, which is the fantasy of those of us who fly in slow planes today. There'll be different ways of doing things.

And we're also at a time in history where we are on the brink of great discoveries with genetics, and health care, and telemedicine, and the ability to diagnose, and the ability to treat, and the ability to figure out what works and what doesn't, which is really very hit or miss even today. Today it's more based on

what doctor you go to then really on established medical principles. And it's based on a system which encourages doctors to do a lot of testing and raise health care bills.

So we have the tools. We have some technology trends which are pretty clear. We're running up against Moore's law in a few years, I guess. But still, there's so many things which are changing the world, including MEMS-- microelectronic mechanical sensors-- which are transformative in their ability to sense different things and their ability to give you information which is important to you, or provide information from things which are connected to things which can act on their own. So your shades can go up when it's right for the energy usage in your home automatically. Or I'm looking forward to not only getting something from the refrigerator to the oven and doing that remotely. Or getting the heat on remotely. These things are starting to happen. Automatic collision avoidance is starting to occur.

So we have a lot of great things that are coming which will transform lives, transform society, and transform jobs. And we have issues. We have issues over privacy that we have to confront as a society over what information you're entitled to keep private. We have issues of the ethical uses of technology. What is ethically good or bad? Can you have glass in your eyes which identifies people and tells you their social history? Well here we are, first generation, Google is saying, we will not provide that as part of Google Glass. Well people like me who are forgetful of names feel that's a real loss.

So there are issues we're confronting in society now which will determine innovation in the future. And my challenge, and the challenge of our industry is to make sure that nothing is cut off that has promising potential and that consumers be allowed to decide these things, consumers be allowed to figure out what information they give up, the way we give information to a tailor now if we want a better fit for our clothing. We have to give up private information. And we have to get over it the way we got over it when we introduced credit cards. Government had a good response there. Government said, you know what, \$50 maximum liability for credit card usage. And consumers feel very comfortable using it-- most consumers-- even though they know that their credit card can be stolen.

Hollar: And get hacked.

Shapiro: As it is. The problem is now private information is associated with that credit card. So you have all sorts of issues. New issues will come up. We have opportunities in education which are absolutely huge now, to figure out that people learn differently. Individuals learn differently and we can get the best teachers. We can get the best education. It can be customized. Well how does that affect teachers and their jobs? How does the driver-less car affect all these jobs? Our challenge with technology in the future is going to be are we creating jobs, or are we not creating jobs?

And if you think of the history of technology-- which I know you do every day-- Americans have been pretty good about using technology to provide benefits. Americans certainly hate waiting in lines, so a lot

of the technology-- we've solved the waiting in line problem. We don't wait in line for a bank teller anymore. We have ATMs. We don't wait in line for a lot of things anymore. We use devices and applications like Uber and other things to get what we want when we want it. So our line waiting time has gone down dramatically through technology.

The question is, can our health improve? Can everything else improve? And how does that affect jobs? And we're going to be struggling with that issue, I think, for years. Because we create a phenomenal number of jobs and opportunities, and there's spillover effect for other service jobs. But the fact is on a net basis, my fear is as technology continually improves, it's going to impact jobs. And I think jobs are not only necessary for a healthy economy, I think jobs are necessary for self worth and a form of life where you are giving something to society, and what you get back is some satisfaction that you're making a difference. And we have to start addressing that.

And it may be that the people who are freed up from jobs are volunteering and helping be companions with older people, or do something else to contribute. That may be an answer but I don't know how that would work economically. We would have to have a discussion. That was a totally different answer to your question, but you said it was my last question so I wanted to get into what I wanted to get into.

Hollar: Good.

Shapiro: And I want to close by thanking you for the opportunity. I think what you're doing here is amazing. Because although it's history, it's recent history. It's phenomenally recent history. And I know it goes back over 100 years in different ways, but we're still at the beginning of this thing. We're still barely crawling as infants and we have a ways to go. And I am just so honored and privileged to be a little part of it by coming here today and sharing my thoughts with you. And if my grandchildren are ever watching this, I'm doing it for you guys, or girls, ladies.

Hollar: That's great Gary. And I hope they will. I hope they are watching it many generations from now. Thanks for doing this today. I'm really glad you're here.

Shapiro: Thank you.

Hollar: Thanks.

END OF INTERVIEW