



## Oral History of Mitch Kapor

Interviewed by:  
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## Mitch Kapor

### Conducted by Software History Center—Oral History Project

**Abstract:** Mitch Kapor, the founder of the Lotus Development Corporation, talks about his personal education and his various pre-computer and early computing activities. He covers the creation of Tiny Troll which later became VisiTrend and VisiPlot which were marketed by Personal Software along with VisiCalc. He discusses working for Personal Software and his reasons for leaving and then starting Lotus Development. He goes into some detail about the specification and development of Lotus 1-2-3 and its great success in the marketplace. He describes some of the other products developed at Lotus and his leaving the company. He tells about his role as “godfather” to Lotus Notes. He concludes by discussing some of his projects and interests since leaving Lotus.

**William Aspray:** Today is Friday, November 19, 2004 and I am Bill Aspray. We’re at the Computer History Museum in Mountain View, California and I am interviewing Mitch Kapor, the founder of the Lotus Development Corporation under the auspices of the Software History Center.

### Information Sources

**Mitch Kapor:** I have a very sizable archive, probably 100 boxes, done by a professional archivist, of everything in my professional career from the mid to late 1970s through, I think, 1999, when I cut it off. I have videos and software, as well as all the paper materials. There are also indexes for all that stuff. So that’s the single best source of my career information. In early 2005 when our office build-out is done, that stuff will at least be physically accessible in my office space. I don’t know what its institutional future will be, that’s to be determined. You know, if I wanted to go look up the best articles on me I’d probably *Google* myself and see what showed up. There hasn’t been a full-scale profile on me in a number of years, because I’ve kept a low profile. Back at various stages there were various magazine pieces, but nothing book length. I thought the treatment in the Cringeley book (*Triumph of the Nerds: An Irreverent History of the PC Industry*, New York: Ambrose Video Publishing, 1996) was bad, biased, and not worth that much.

**Aspray:** What about material about Lotus from a historical point of view or just a general point of view?

**Kapor:** Well, I think the revised edition of *Fire in the Valley* (Freiberger and Swaine) had quite a lot about it. I don't actually have a standard book that I point people to about the history of PCs. I mean I have a shelf full of the usual things.

### **Background and Education**

**Aspray:** I'm going to ask you quite broad open-ended questions. Why don't you tell me about all of the things that you think either prepared you or didn't prepare you for your Lotus days?

**Kapor:** Well, so where to start?

**Aspray:** Education.

**Kapor:** As I said this morning, there's a two minute answer, a 10 minute answer and a two hour answer and I think I'll give you the 5 to 10 minute answer because it's a pretty big subject-- let's see how I do.

**Aspray:** I'd rather see you go into detail on a subset than just gloss over things.

**Kapor:** Yes, so I'll go into some detail and if some of its interesting then you can ask me more about it. First of all, as a kid, I was quite good in math in a distinguished sort of way. And my parents had me skipped out of second grade so I was a year younger than everybody, as well as having a birthday that was in November -- at the end of the cycle -- so I was basically a year and a half to two years younger than the others in my grade. Socially that put me at a big disadvantage, which tended to reinforce my interest in things I was good at and competent at. So I had some aptitude. I was fortunate in junior high school and high school in having early exposure to computers. I'm 54 -- I was born in 1950 - and so I was a teenager, an adolescent in the 1960s, when it was unusual to have access to computers in any kind of hands-on sort of way. But when I was in ninth grade, I actually -- with a lot of help from my father -- built a very small computer. There was a book with a title like *Build Your Own Computer*, which I actually have a copy of, that had plans where you could build -- using discrete transistors -- a series of 10 flip flops and hook them up together as an adder driven by a telephone dial --as the input device -- and they could add or subtract and they had little lights. So we could do simple addition and subtraction between zero and 1023. There were plans in the book and so my father and I built this computer and I entered it into a science fair.

**Aspray:** What did your father do?

**Kapor:** Well he did all the soldering...

**Aspray:** Not just on this project.

**Kapor:** He was trained as a civil engineer and served in World War II as a naval officer and became an – although we never used the word -- entrepreneur. He had a small, corrugated box manufacturing and distribution business that he ran for 40 years with his brother-in-law, my uncle, my mother's brother.

**Aspray:** Did your mother have a professional career?

**Kapor:** She went back to graduate school, probably when I was in junior high school and got a library science masters and worked for a period of years as a children's librarian. When I was in 11<sup>th</sup> grade -- I was 14 or 15 -- I had exposure to computers in that I was at the Columbia Science Honors Program on weekends, which was an NSF funded thing that they did in those days, and I took a computing course which was sort of a survey of topics on computing. Then after my junior year of high school I went to a summer program, again NSF sponsored, called the Summer Science Program that was a life changing experience. It was at the Thacher School in Ojai, California. Thirty very bright kids, all boys in those days; it was an astronomy program where the project was to compute an asteroid orbit and they had a "what was originally a Bendix GT-10 computer, which was this ancient thing, but we could use it hands on; it was just there, and so I actually did some programming. It was a 7 decimal digit machine, not a binary computer at all. So that's where I first did some hands-on programming.

In my senior year of high school, my school district actually offered a programming course. It had just received an IBM 1620, not the 1401 that it was using for administrative purposes, and they taught a programming course. We were punching decks and running programs and I was fascinated. I discovered that I was not a particularly gifted programmer. I made too many mistakes. My mind was always getting ahead of me; I could imagine what I wanted the program to do but I did not have the mental precision to do all the fine work of actually making the programs work properly. I could -- with huge amounts of effort -- get simple programs to run but good programming is kind of a performance skill. So it was very frustrating to me, and I went to college and wound up -- at 16 -- at Yale and discovered that pure math was not my thing. It was just way over my head, and I was probably smoking too much marijuana at the time too; my brain was clouded. I got very interested in the counterculture, and I was mainly on the Yale radio station and barely squeaked through academically. But I had one course in programming that was on APL (A Programming Language), which was great. For my senior thesis I defined an interdisciplinary major on my own with my linguistics professor. I was trying to major in "cognitive science" but it hadn't been invented yet. But I wrote a big simulation in APL, for this professor, based on his theories of language -- of how language works in the brain. So I had almost a love-hate relationship with computers. I was fascinated with them and could do certain things but couldn't really program.

## Initial Jobs

**Kapor:** When I moved to Boston in 1973, I didn't have a job. My first wife got a job in public television and that's how we wound up in Boston, and I wound up -- through accident really -- being hired by a computer consulting company. My ex-wife's parents had friends in the Boston area who literally lived next door to a guy who owned a computer consulting company who hired me sort of on spec. I was doing low level market research analysis jobs. I was not very good at it, but they didn't fire me. I bought a copy of Ted Nelson's book *Computer Lib*. I still have it -- it's a first edition -- one of the ones he did himself in Harvard Square. I used to frequent the bookstores and magazine stands. I was totally hooked and fascinated, and I said, "This is it, I want this." It was all so wrong and so right looking back on it. The vision that computers should be empowering tools for individuals was right; everything else --technically -- was just completely off and wrong.

But PCs hadn't been invented yet. So, I was meanwhile drifting through life and became a professional disc jockey after college. I was on the air and became a teacher of Transcendental Meditation. I did that full time for a couple of years. Then I picked up a masters degree in counseling psychology and worked as a mental health counselor in a psychiatric unit of a hospital. Basically I didn't have an organized plan. But by this time, PCs had hit the market and I was totally fascinated; there was a phase where there were kits, but I still couldn't solder. At the point at which the first S-100 bus machines were available, I would just go to the computer store and hang out. I had no money -- zero -- I couldn't afford one. Actually, I bought a TRS Model I (from Tandy Radio Shack) when it came out in 1977, as one of the first machines. I didn't know what I wanted to do with it; I was just going to play with it. It was sub-critical mass in terms of being an interesting machine. You just couldn't do that much with it. It was 4K and didn't really have graphics. But I then bought an Apple II. I had no plan; I just knew that I needed to have one and I literally had to drive to New Hampshire to avoid the sales tax to get it. I stayed up all night playing with it and writing little programs in BASIC (Beginners All-Purpose Symbolic Instruction Code). I had picked up BASIC programming along the way and I became fairly fluent in BASIC. The day after I bought the Apple II, in July 1978, my career actually started in PCs.

## Consulting on Using PCs

**Kapor:** Now we're on the fast run up to Lotus. I was in a computer store in Cambridge, Mass. I was unemployed. I thought I might be going back to graduate school. So I was hanging out in this computer store; again, with no plan. A customer was buying an Apple II. This was a well-dressed guy, in a suit, in his forties. I'm eavesdropping on the conversation. He's an ophthalmologist and it was clear he didn't know exactly what he wanted to do with it either but he was going to use it somehow in his practice and he'd be able to take a tax deduction for it. I literally went up to this guy and I said, "Sir, I am a consultant and I think I can help you." I do not know where I got the *chutzpah* to do this because this was very atypical for

me. I mean it's true, five years before that I had worked for a consulting company doing jobs but that was it. He hired me at five bucks an hour, so he wasn't risking a lot. But I actually wrote a set of programs for him in Apple II BASIC that he used in his practice to do various things, such as intraocular lens calculations after surgery, and it worked. He was happy and I was happy. I started getting consulting gigs, a few here and there. That's how I started writing programs in BASIC for one guy who did investment analysis. Then it helped that my old employer was in a bind with a client and they called me up and said, "Can you come and help with this thing?" Ordinarily I would have said, "Forget it, I have no interest in it," but since I was half supporting myself, I said, "Sure, I could use the extra work." So between that and the PC consulting, I had a little consulting business and all of a sudden I was supporting myself doing this. I was probably one of the first people in the world to be doing this. Incidentally, there were two floppy disk drives on an Apple II in 1978.

I co-founded the first Apple User Group on the east coast, was totally into the Apple kind of culture of the day, reading everything I could, meeting people, trading software with other people, etc. I was just like a sponge and getting more clients. I applied for a job at Apple; even though they didn't take me, I still went out to California. The key event was that I had a friend that I met through the Apple owners' network who was a grad student at MIT, in finance, who was writing his doctoral dissertation. He'd run out of funny money for the MIT Computer Center and he said, "You know what I'm doing is just multiple regression statistics. I know the math but I can't quite program it, do you think you could do this?" I just did it as a favor to a friend and wrote this thing. I said, "Look, you explain the math to me because I haven't had that piece of math." I wrote it and he used it, and one day we're sitting around -- we're just hanging out -- and it was like a cartoon where the light bulb goes off over a character's head. I don't know if he (Eric Rosenfeld) said it or I said it, but it was: "Do you think people would pay money for a software product that would do this?" This is pre-VisiCalc. The only packaged software you could buy were things like *Micro Chess*. It was not even shrink wrapped, it was in plastic bags. There was basically no packaged microcomputer software market; it was just totally in its infancy.

### **Building *Tiny Troll***

**Kapor:** I got into that business because I had the consulting experience and I wrote this program called *Tiny Troll* in BASIC on the Apple II based on a program called "TROLL" (Time Shared Reactive Online Laboratory) that was a big mainframe system for statistics and econometric analysis developed at MIT. We implemented only about 1% of its features -- so you could enter a time series, you could do means, you could do operations on times series, and you could do graphs of this stuff and regressions. We started selling it by mail order out of my apartment. It never made a lot of money. We sold a couple of thousand copies and that's how I learned the business. We just did it. There was nobody to say "no" to us, and we learned what worked and what didn't, and what other people were doing, and it was all pretty friendly and collaborative. I decided I needed to go to business school and learn something because I

said, "There's going to be two markets -- business software and games." I didn't have a feel for doing games. I knew I wanted to design software although I didn't even know it was called that. But I said, "I don't know anything about business." My father had always totally sheltered me from that, and he said, "Go be like a college professor or something."

**Aspray:** So how does this all reconcile with your self-claimed programming skills not being as strong as you would have liked?

**Kapor:** Well, they're not; I suck. I would not hire me as a programmer. I wrote stuff in BASIC that was sort of sloppy, not well-structured, bad practice. But because I was willing to work 14 hours a day, and I'm quite bright and I was incredibly motivated, I made this stuff work. I have high quality standards, but it was not easy. It was not easy.

**Aspray:** But did you like doing that? I mean, it sounds frustrating to me.

### **Working with and for Personal Software**

**Kapor:** It was a combination of liking to get it done, and being frustrated because I recognized that there were other people who were just much more gifted. It was from the *VisiCalc* guys that I learned that. I did *Tiny Troll*, and I went to business school at Sloan because they had a 12-month MBA program (Masters of Business Administration). When *VisiCalc* came out, everybody knew everybody else; there were only six people in the business. I met Dan Bricklin and Bob Frankston) probably at the user group called New England Apple Tree. Neat. I hadn't met Dan Fylstra because we were in Boston and Fylstra was then in California. I met Frankston and Bricklin in Boston, which is where I was. I looked at *VisiCalc* and I was totally blown away. I said, "This is incredible; this is a huge breakthrough conceptually." I could never program something like that in a million years myself, because it was done in assembly language and it had lots of difficult routines; they did floating point math as well as fixed point math. What happened was that the Personal Software guys, Fylstra and Peter Jennings, approached me because Frankston and Bricklin referred them to me -- as somebody basically to re-purpose *Tiny Troll* -- clean it up and add some stuff to it, so they could bring it out as a companion product to *VisiCalc*. They needed more products and I had something.

So, I signed a contract while I was in business school. I thought I would just touch up *Tiny Troll* over my Christmas break and the independent activities period which followed it -- while I was finishing my master's degree and figuring out what I was going to do. I had no idea. But I was so blown away by *VisiCalc*, I said, "You know, even though I'm writing in BASIC and I see some ways to improve *Tiny Troll*, I have to do something that I'm not going to be embarrassed about." So I invented the moving cursor menu -- the thing where you've got the menu bar across the top and the highlight goes from item to item and the prompt changes for each one because that was within my capabilities to do. I had to take a leave of absence from school because I knew I



wasn't done. Everyone thought I was nuts not finishing my MBA. I was one term away from finishing my MBA, but I said, "I need to finish this." Then I thought I was done and I wasn't done. Somebody said that what I had was an advanced prototype or an early *alpha* version. But I had learned enough, because I was just a sponge. I knew I always made Dan Fylstra uncomfortable, personally. I mean he's a difficult guy, but I learned the reason later. I would stare at him whenever we met and think: "What does he know that I don't know? How can I learn that? Can I do what he's doing?" I would just laser in, and it was the first time in my life it all came together -- where I was good at something, I was motivated, and the world seemed to care about it enough that I could make a living at it. I went to Fylstra and I said, "Look, I don't know how much you want to get into the economics of this stuff, because the economics are very interesting and actually critical to what happened. So let me just do the stuff myself." It is actually the pre-Lotus stuff that's the part I remember much better than the Lotus stuff. It all got so big, so fast, whereas for the pre-Lotus, the 1978 to 1982 period, the details are very clear in my mind. The *VisiCalc* guys wouldn't tell me what their deal was in terms of royalties. I knew they were getting a royalty, and I knew it was pretty big. They were very secretive to the point of being paranoid. I mean, as I said at the workshop this morning, I went to them early and said, "I should come on board and we should join forces. I could add value." They were just like totally uninterested, you know. But Personal Software came to me in the fall of 1979 and said, "Look we published *VisiCalc* a few months ago. We're signing up more things; we've seen *Tiny Troll* and Dan Bricklin and Bob Frankston say you're a pretty good guy." And I signed a contract. Well my partner and I did, but he was kind of moving out of the picture.

**Aspray:** Who was your partner?

**Kapor:** Eric Rosenfeld, who went to Salomon Brothers and LTCM (Long-Term Capital Management). It was a friendly separation; he just didn't want to be in that business; he was a professor at Harvard in the finance department and helped me some. I did this contract and we negotiated a royalty rate so that 33% of their gross went to me -- which, you know, was high. I didn't know the *VisiCalc* guys' percentage was 35.7%, so I came within a hair's breath of it. I think they gave me a \$20,000 advance, which was great. The most money I'd ever made in my life was \$14,000 a year. I'd been very hand to mouth and in between jobs. I had figured out, just from focusing, that that was too high a royalty rate to be economically sustainable. There was a lot of tension around this, because Personal Software was doing all the marketing and the support and they were getting -- I don't know -- \$1 million a month. So I realized that the right thing was to have stock in a start up. I went to Personal Software and I said, "Look I'm almost done with the product. I got this big royalty stream, I'll trade you back the royalty stream for an equity position, and I'll come out and work for you as a new products manager and help you get new products out." So they hired me. I moved to the West Coast. The product wasn't done and I wasn't getting much further on it because I had this day job. As it turned out, I spent six months in Silicon Valley learning the ropes working in this 18-person start-up that had just brought in venture capital and a "professional CEO." That's where I learned the Valley way of life. That's all I did day and night. And I discovered I didn't like working for these people.

I don't like working for others, and I have problems with authority. But, in particular, they weren't taking advantage of my skills; I wasn't someone who "knew what they doing or had the right credentials" and I was getting further and further displaced from the center of power. It was terribly uninteresting and I didn't really like living in Sunnyvale. Who would? But I didn't want to live in San Francisco because of the commute, and so I said, "You know what? Since we never actually consummated the stock deal -- it just had never gotten done -- I said let's not do that. I'm going to go finish this product, you need the product, and I can't do the job and finish the product." They were perfectly happy to get rid of me.

### **After Personal Software**

I moved back to the East coast and I finished the products. It took me another six months. I signed a contract in November 1979, and in April 1981 they brought out *VisiPlot* and *VisiTrend*, which worked with *VisiCalc*. It had taken me like 16 months or something. You could take data from *VisiCalc* and export it using the data interchange format (DIF) that was developed by Bob Frankston with some assistance from me. After booting *VisiPlot*, you imported the file and made a graph out of it. We were making money hand over fist because of the high royalty rate. In six months we did 5 or 6 hundred thousand dollars in royalties -- just in royalties.

So what went on? I bought my partner (Rosenfeld) out by mutual agreement, I put some money aside, I bought a house and I was trying to figure out what I was going to do next. They were busy porting *VisiCalc* to other platforms. We had a bunch of ideas; we tried to do a *PowerPoint* like thing called *Executive Briefing Systems* and kind of got it half right. It was a *PowerPoint* precursor.

**Aspray:** You said "we"?

**Kapor:** Well, I had a couple of high school kids working for me. And the significant hire I made was Jonathan Sachs, whom I knew because before I moved to California, one of my clients was an Apple distributor. At that time, Apple had external distributors to advise them on what new software titles to stock and sell to their dealers, and then do dealer training, etc. I did that. The general manager of the local Apple distributor was an ex-Data General employee (Bob Washburn), and he had a buddy, John Henderson, who was one of the very senior early Data General software guys. Henderson and Jon Sachs were at DG and spun out and did the spreadsheet program for DG. I had met Bob Washburn and he said, "Can you go and talk to Henderson because they need some advice about what to do with these things in business," and I looked at him and I said, "They're on the wrong platform. You know, you want to at least get onto CP/M." I said, "*VisiCalc* has the Apple II sewn up." This was before I met Sachs. That partnership split up, and Sachs found me and he was trying to figure out what to do. I said, "Well you should come work for me." I could hire him then since I had royalties coming in. I said, "I don't know what we're going to do exactly but you should come and work for me." He had some ideas about stuff.

I also realized that I needed to go to Personal Software and have them buy me out because they had every incentive to screw me on the contract. They didn't like me, they were paying an unreasonable amount of money and I knew that, and I knew that they were getting deeper and deeper into a fight with Software Arts because I would talk to people on both sides about the royalties. They should have just modified the contract, but instead both sides were greedy and neither side would budge. They were young, immature, and not disciplined. And I said, "I'm just going to sell out and get what I can to get my freedom." They paid me \$1.2 million.

So I had like \$1.8 million gross money and it was like insane, totally insane, unexpected. My partner got 25%, which was fair. I had to pay Uncle Sam a bunch of money. Anyway, when it was all paid, there was \$600,000 left and I said, "Well what am I going to do now? I'm going to divide it into two piles. Half is going to be for me personally and half I'm going to put back in when we figure out what to do next." So what was driving me? There were a few things. The first is that I really wanted to be a software designer. I could envision ideas for things. I thought personal computers were great; they empowered people in an intimate kind of relationship -- overcoming all the problems I had had with computers before. I could make them do things and I said, "Everybody's going to want one of these. Now don't forget this is early, but I was a believer. I had the religion. And I didn't want to have to work for anybody. I did not have a good employment record. I really knew that I had a bad attitude. I thought that I was smarter than every single boss I used to work for, and it grated on me. The reason I set aside \$300,000 was, I figured that it would take me maybe \$30,000 a year to live -- and I could live for a long time and not have to work if worst came to worst -- and that was the deal. I bought a house. I bought, I think, the cheapest, least expensive house in Cambridge in the early 1980s. And I took the rest and started figuring out what to do next, and that was the seabed for Lotus.

### **The Next Spreadsheet Product**

So, I'd had all these experiences. I was a consultant, I'd founded a user group, I'd written stuff, I'd brought a product to market, I was a product manager, I'd worked with other authors, I had done product management, I had done project management, but I had no formal-- you know, no MBA -- management experience as such, and was totally self-taught technically. I had taken an APL course. But I had a lot of good, highly relevant experience, and I had been -- for that day and age -- already successful. It's interesting how even though Sachs wanted to build a kind of programming environment around the spreadsheet that hadn't been done and I wanted to do a kind of better spreadsheet, I couldn't admit to myself that that's what I wanted to do. I said, "Well *VisiCalc's* already been done and I firmly believe that nothing is going to dislodge it from the market." I just had no idea of how big the market was going to grow. It was just such a killer product.

So, we fiddled around some and, as I said this morning at the workshop, the IBM PC was announced and it changed our strategy that day. We had to wait four months for an assembler to be available; we tried writing in "C" and it wasn't fast enough. Jon had implemented a

spreadsheet several times already. That was a huge win. He knew what he was doing. He wrote code fast and tight. It was just one person. We used to meet every week or every two weeks, depending on the phase, and look at what he had done. We always had a working version. I was the designer. I'd say: "Now this feature needs to be like this; we need to have this and that." That's what I did. We dropped the other stuff that we were doing, and I was just manically focused on making a great product. I don't know what it is in me that gave me that skill. People have different aptitudes: some people can play the cello, and some people can write like a dream. I can look at a piece of software and say: "This is good, and that one sucks." I'm not always right and have a million ideas about how to change it or fix it, but that was critical. And then, you know, I was scared of venture capitalists.

When I was living in Boston, before I moved to California, another guy had asked me to sit in on a meeting when they pitched to a VC. I was a consultant. He wanted to bolster his team. I think we were pitching to Charles River, a big firm. There was a guy named Pat Lyles (who died a few years ago and taught at Harvard or used to teach at Harvard and was a VC) and he just eviscerated this entrepreneur. The plan wasn't very good but I was like a flower child. You know, I was like a meditation teacher. I said: "Whoa! I never want this to happen to me." I mean, he was just merciless. I thought: "This sucks, you guys haven't thought this through." And I'm going: "Oh!" and I was just off to the side. Then I met Arthur Rock. So I really went to Ben Rosen because Ben had bought a copy of *Tiny Troll* and he was sort of affable and I had seen him socially one or two times at Personal Software and I thought he's not going to hurt me.

**Aspray:** What was Arthur Rock like?

**Kapor:** Well, he wasn't putting on a big performance but I got to sit in on one part of one board meeting at Personal Software, and I think Arthur put in money individually. I don't remember whether they had money from Venrock, but anyway, Arthur was at the board meeting and there was some situation they were talking about and he basically issued an execution order on somebody or some project as casually as I'd flick a flea off my arm. It was like no big deal, just business. It was like a "Godfather" kind of moment, and I'm going: "Oh! These guys are serious!" I didn't like the low value they put on human life. I mean they weren't killing anyone, but it was a decision that was going to have an enormous personal impact on somebody, and they very casually said, "It doesn't fit with what we're doing." So that was formative. You should look at the Harvard Business School case study on Lotus, because it has my 17-page letter to Ben Rosen. It's a great document and generations of B school students still see this.

**Aspray:** Was Rosen working for Kleiner Perkins?

## Starting Lotus Development

**Kapor:** No, no, he had just founded Sevin Rosen Management. He had been a Wall Street analyst, and then he'd been an independent analyst and then he raised a fund with L.J. Sevin who was a semi-conductor guy who founded Mostek. They were "newbies" in venture capitalism. I think we were their third investment. But he had kind of legitimized the industry. He'd put his *imprimatur* on it. He had enormous credibility. That's what he brought. I mean he wasn't an operating business guy, far from it; he wasn't much of a strategy guy, but if Ben told Wall Street: "You need to show up" -- he was like a Walt Mossberg today except Mossberg does consumer stuff -- people would show up! He gave instant credibility to anything he put his name to, which helped us a lot.

I know this is a long answer but this is the best question. I reluctantly concluded, according to my process at the time, that I needed to start a firm to publish the software myself, based on unhappy experiences with Personal Software, the loss of control that an author has, and the fact that the publisher makes a set of decisions and really controls the product. And that was just not okay with me. These were my babies; I cared about them. I hated being patronized by those people. And they patronized me. I don't know which was worse, that or being ignored. It just pissed me off even though I didn't really want to start a business. Now I think that some of that was a sixties kind of counterculture idea: business is really uncool, but some people-- some entrepreneurs -- just love doing business, they don't care what the product is, they like making things happen or they like being successful or they like hurting people. I discovered I have a gift for organizing ventures. I just kind of know what to do; I figured it out, I didn't have to get taught much about it. I certainly didn't learn anything useful in business school about this. In fact, I had a number of humorous experiences during the brief time I was in business school. They had one course on new ventures. I got a "B" in the course. The whole grade was based on a business plan, which I wrote as a pre-cursor to the Lotus plan. But it was about packaged software business applications and they thought it sucked. Actually, as business plans go, it wasn't great because there was no market research or demonstrated need. But you couldn't have done market research then, people didn't know what they wanted. You actually had to go and make a market! I didn't always know what to do, and sometimes got stuck, but I just had confidence: "Well you come work here, you do this, we'll figure this out." So I just did it. Nobody told me I couldn't, you know.

## Lotus 1-2-3

So that all led up to *Lotus 1-2-3*, the success of which came as an enormous surprise. I was shocked at how successful it was. I never expected it. I was probably as surprised as anyone on the planet or more. I knew the product was good. I liked the product, but I had no sense that the market was going to explode -- that there was this latent demand and that the combination of the IBM PC plus *Lotus 1-2-3* would fuel this explosive growth. So my life changed very dramatically, and the numbers tell the story. In 1983, when we shipped *Lotus 1-2-3*, we went to

\$53 million in sales from essentially zero the year before, and then to \$156 million in 1984. We were the biggest software company on the planet in 1984. I just saw the issue of *Softletter* in the material they gave us for this meeting. Lotus grew from 20 people to 250 employees, to 750 employees at 12 month intervals, and I'm running the thing. That's a whole story unto itself, what that was like. There aren't a lot of people who have had that kind of growth. There was *Netscape*, there's *Google*, and there was *Lotus*. And, you know, we were profitable from day one, as soon as we started to ship. We went public within six months or eight months of shipping the product, and it was a whole stressful experience.

**Aspray:** So let me ask a whole series of more focused questions. What were the main technical challenges?

**Kapor:** There were a few big technical challenges. Machines had relatively limited resources. Although personal computers went from 64 kilobytes of memory to 640 KB on the IBM PC16 bit machine (PC-XT), you wanted to make the code footprint as small as possible to allow the larger spreadsheets to run. The big issue was performance, because people were building very computationally intensive spreadsheets, so they needed to have a bigger memory and they wanted very, very fast performance. That led to writing *Lotus 1-2-3* in assembly language, which I didn't do, but that was a jointly undertaken decision. That proved to be a big advantage. You have heard how it was 37 times faster or 15 or 10 times faster than another product, *Context MBA*. It is a small technical point, but speeding up *recalculation* was important. If you change one of your inputs -- interest rate to 12% instead of 10% -- you want the new bottom line figures to be calculated as quickly as possible. So we did something called natural order of recalculation, which was an advance over what *VisiCalc* had done -- which just basically went either left to right and row by row or, through each column one at a time if you changed something. But the problem is that if you have a forward reference, i.e., if the value in "A1" depends on what's in "D8" and you calculate "A1" before "D8," then you may be using an old value of "D8" -- because by the time you get to "D8" the value may have changed. The trick is to figure out the best order to recalculate the cells, and we did that in *1-2-3*. That actually helped a lot in speeding things up, because the other way you'd have to take multiple passes over the sheet until it all resolved. So, okay, now we've got the right value for "D8" and we put it in "D1" and so on. So that was a technical challenge. We also wanted it to be bug-free. We did a big QA (quality assurance) job on it, which was unusual for those days. Just really banging on it very heavily. Picking the platform was important. That was more of a marketing decision.

**Aspray:** What were the issues there?

**Kapor:** It was not obvious when IBM entered the market that they were going to win. I mean, totally not obvious. It was greeted in a lukewarm sort of way, because IBM hadn't been a player at all, and I said, "16 bits is the right size," because we knew we couldn't do what we wanted in an 8 bit machine. And I said, "The IBM brand is a very big deal for legitimizing personal computers for business, and they're smart because they're going to outsiders to get

help – outsiders who know what to do about distribution like *ComputerLand* and *Sears*, and they're going to *Intel* for the chips, they're going outside for software because they -- IBM -- don't know how to do these things. It was a totally different kind of computer. If they did it themselves, they'd screw it up the way Digital screwed it up. So I said, "That's the right bet." And we bet on it, even though *VisiCalc* and *MultiPlan* had been out on the market for the IBM PC 14 months before we ever got to market. All this talk about first mover advantage is sometimes very overstated because you can come in -- and not be first in the market -- if you have some sort of huge technical or marketing advantage, like if the market was about to explode in size or something like that.

**Aspray:** So you were really still first to market for the big market if not for the early entries.

**Kapor:** Right.

**Aspray:** What about product specifications? What were the issues there? How much did you look at your competitors in doing those things?

**Kapor:** Oh, I looked intensely at every single competitive product, and this was the subject of a later lawsuit, which we won. I have all the papers, all my design notes, they're all indexed, and I won't go into all the details of it, but basically, what my documents showed was that we considered five or 10 different design alternatives, and we looked at lots of different products, we added things, we changed things, there was no wholesale copying or lifting of ideas from anybody. The biggest design disagreement I had with Jon Sachs about 1-2-3 was whether to put in keyboard macros, and it went something like this. I basically had the idea that end-user programming environments would be a very big deal because you certainly want to be able to automate repetitive activity, but sometimes you need to put a little bit of procedural logic around something that you've done. Sometimes, you want to put a little user interface on it, to create some new menu items and to guide people through stuff. I had seen keyboard macros in text editors. In fact Sachs had done that at Data General, and I said, "We need to do this." And he said, "I don't want to do it, it's a bad idea, and it's a support nightmare." What he meant was that people used to call him up at Data General because he was the author of the text editor, and say: "You wrote this thing and it doesn't work, can you help me?" The problem of course was in the logic of the construction of the thing. And I said, "Jon, I promise you, people aren't going to have your phone number; they won't call you up, but you've got to trust me, you just really need to do this." And he went with me on it.

I had put in code so you could define your own user interface and your own prompts; anything that you could do from the keyboard, you could do in a macro and you could also have "if- then" statements and branching. It was an end-user programming environment. That was one of the reasons we won in the marketplace, because it just totally unleashed the power of end-users.

This is the same reason that the *Visual Basic* and *HyperCard* and basic HTML programming became popular. We did that. That was big.

**Aspray:** What were the other reasons why *Lotus 1-2-3* won in the marketplace?

**Kapor:** It was five times faster than the next best spreadsheet -- speed, bigger memory space -- because nobody else took advantage of the full 640K. *VisiCalc* was basically a re-programmed 8-bit code, and it ran in a 64K space on the 640K machine -- and the guys were so busy arguing with each other they didn't do the obvious thing which was to fix the problem. It was just that they took their eye off the ball. So it was size, speed, and integrated graphics. You could with one-click see the graph from your spreadsheet. You could not do that before. That was the killer feature when we demo'd it. I mean, literally, people used to applaud -- as hard as it is to believe. I would say that macros would be the next best one. Then we did a bunch of marketing things that nobody had done before. We sent teams out to train dealers. We included a demo disk with a tutorial, a self-learning kind of thing that you could sit and watch and step through -- the demo showed you how to use it. We had lots of support, lots and lots of support because there was no after-market of books or training or anything, and we realized we needed to do that ourselves. Then we did very professional marketing graphics, and ads in the business press. Good execution is no big deal now, but believe me, back then a) nobody knew what good execution was, and b) nobody serious was starting a PC software company because it wasn't a legitimate field -- you couldn't make it -- you know? You got no respect. We were the first to just be competent. That was such a huge advantage. I mean, the product really was great and it had essentially no bugs in it, it just ran -- and people were happy and they could do all this kind of stuff that they couldn't do before. And there we were, and it just exploded.

**Aspray:** Were there issues about distribution?

**Kapor:** Not really. When we went to the 1982 Fall Comdex we introduced the *Lotus 1-2-3* product. It was either September or October of 1982 at the "Windows on the World" in the World Trade Center -- which was by invitation only -- that we got some press in the Wall Street Journal. At the first public demonstration -- we're on the floor at Comdex -- in those days you could take or write orders on the floor. It really was a trade show for dealers and distributors. This was before it turned into the big thing that it turned into before it died. We went out with 10 or 12 people when we only had 20 people in the company. We'd had a little press, but nobody had actually seen the product. I'm in the booth giving demos and we wrote \$900,000 in orders from the show floor. That's when we knew that we had something much bigger on our hands than we had imagined. Then we just needed to ship the product. People couldn't get their hands on it fast enough. Our challenge was to set up enough disk duplicating machines. There were no third-party disk duplication services, at least none that could handle the volume. So we had to buy a bunch of machines and set up a factory with shrink-wrap machines, and we were just meeting the demand for the product and making sure somebody was there to answer the phone. It was a big challenge to go from zero to \$53 million in sales; we sold several hundred



thousand units; it was unbelievable. Then we were in a commanding position when it came to making distribution deals and arrangements. There were people that had other attitudes about it, like *BusinessLand*. I forget whether they were in bed with somebody else or they just started to take it seriously. But the market spoke pretty loud. So they were in the position of needing to carry it, and do the right thing by it.

## Running Lotus

**Aspray:** What was day-to-day life like, managing this company?

**Kapor:** Oh, God! I was so young; I was so innocent. It was pretty overwhelming. I would say I lived with a low level of terror the entire time, kind of thinking I might wake up one day to find out that it was all gone. I really worried that I would make a stupid decision or have an oversight, and we would disappear as rapidly as we had appeared. It wasn't totally crazy to think that. That's what had happened to Osborne Computer Corporation: zero to \$100 million really fast, back to zero even faster. They made a couple of fatal mistakes and they were no more. But Adam Osborne was not a good entrepreneur; he was self-destructive and I didn't understand that. I didn't know how to calibrate. But that's what I was afraid of; there were insurmountable opportunities, and the phone was always ringing with people wanting us to do this, do that, or do the other thing. It was a "kid in the candy store" sort of thing.

What do I want to say about what it was like day to day? Several things happened. One is that we just were entrepreneurs, what we did not have then was a cadre of experienced, trustable senior managers that you could hire. As board members we've now been through this; we now know about how to manage explosive growth -- it's hard. But there wasn't anybody. So we were kind of on our own and Ben Rosen resigned from the board to go on to try to conquer new territories. That was both good and bad. No adult supervision. I mean I was in my early 30s, in a very tough atmosphere; lots of people just couldn't deal with the change and the uncertainty. What I didn't know about how to hire, how to run things! I've now spent 20 years helping entrepreneurs and start up situations. I have been on lots of boards and been an angel-investor in dozens of companies and have probably done informal consulting with hundreds of companies. You know, you learn stuff. I wish I knew 5% of that then, but of course I didn't, and so some things went well and some things were terrible. We created a very progressive corporate culture. I was such a bad employee. I had this attitude, and the woman I hired as my office manager was a political radical -- this is at the very, very beginning -- who needed a job, and I was more comfortable hiring other odd ball people because I felt more comfortable with them. She just had a very left-wing, progressive attitude, much more so than I, but I kind of liked having that in the mix. She hired Freada Kapor-Klein, who's now my wife, to be the Director of Employee Relations with a charter to build the most progressive corporate culture in the US. We did all of this outrageous stuff that I'm extremely proud of, and that people love the company for, and which has had a very significant long-term impact.

**Aspray:** Give me some examples.

**Kapor:** Some examples. We had a corporate values statement. Usually corporate values statements are bad for morale because you do it and people realize, this IS NOT the reality. Oh, that really sucks. But we made a real effort to keep the two tied together. Managers' bonuses were tied in part to how well they were rated by the people who worked for them -- embodying the corporate values. So we put it in the paycheck and they did not get their bonus unless they lived up to our values. We gave back profits. There was an employee-run Philanthropy Committee, so the employees actually made the determination of where the money went as opposed to the pet projects of the senior managers. We had very serious diversity efforts ongoing. We had a very diverse work force. We were the first corporate sponsor I believe anywhere of an AIDS walk, which then became a big thing. We adopted the Sullivan Principles and wouldn't sell into South Africa. We had a very egalitarian kind of culture, based on respect and fairness. I'm really proud of that.

On the other side, we were growing so rapidly, we could never catch up with ourselves and we undid a lot of the good that we did by having a new boatload of employees show up every week. The counsel I would give now is to be more disciplined about taking on opportunities in favor of maintaining more integrity. We had no product strategy. I was interested in all sorts of stuff, so we tried this, we did that, we did the other, and it was not coherent. A much simpler "stick to the knitting" or "apple pie effort" like "Let's do a good word processor," would have served the company much, much better. At the time, it seemed like "Well, there's no point to that, *WordStar* owns the market." We were just so wrong about that. I was great one-on-one with people and with big groups. But we really sucked at having a middle tier of management, and of empowering and building those folks, and we suffered for that. I did a terrible job in picking a successor.

### **Leaving Lotus**

**Kapor:** But I felt desperate after a certain point. After a couple of years, it was like I didn't want to be there for a number of reasons. One was I got tired of spreadsheets. I don't particularly like enterprise customers. I mean as individuals, they're fine, but it wasn't my vision of personal computers empowering people when they came and said, "You're putting too many features in your releases, slow down, we can't digest this stuff." So I didn't actually like the business side of the business. And I didn't know enough then, understandably, about how to carve out a protectable niche for myself in a way that the company could do its business, it could maintain integrity in the culture, and I could go and run R&D and do interesting things. So, you live and you learn. I mean I don't feel bad about it. There were sharks in the waters there, and I just jumped before I realized that if I were going to stay, I would have to kick out the guy that I appointed as the CEO and become the chairman, and I just didn't want to do that because then I would feel responsible for this whole thing, it's all going to be on me. So my

personality and my vulnerability showed a lack of self-confidence. Where I was as a person then was really a big contributor to my thinking, and I just decided to leave in 1986.

### **Follow-on Lotus Products**

**Aspray:** Could you talk about some of the follow-on products?

**Kapor:** Oh yes. We did *Lotus 1-2-3.1*. We did *Lotus 1a* – just about everybody does a *1a* or a *1.1* version. What was the next big product? I had an idea to do an all in one “office suite” that was called *Symphony*. Technically, it was built on the wrong foundation; it was built on the spreadsheet as a foundation, and, believe it or not, it was just *1-2-3*. We sold I don’t know a couple of hundred million dollars of it but it was basically a kind of *1-2-3* with a bunch of other stuff. So that wasn’t successful.

**Aspray:** Wasn’t successful in what way?

**Kapor:** In being its own sort of revenue center, independent of *1-2-3*, and it didn’t displace *1-2-3* either. It was like a line extension kind of product. We did *1-2-3 version 2*, and a *1-2-3 version 3* after I left. On the Macintosh we did *Jazz*. We would have done an Apple version of *1-2-3*, but we couldn’t get an Apple because Microsoft had an exclusive with Apple, which we didn’t know. We had to wait until the Mac came out in 1984. We thought *Symphony* was the next big thing and *Jazz* was like *Symphony*. So it was the wrong product architecture and it came out in 1985 -- at a terrible time -- and we did not have persistence with products. Because *Lotus 1-2-3* was always 90% of the revenue, people would say: “How can we make a case for continuing to invest in something else?” We should have been patient and agreed that we did not know which one of the half a dozen products (which accounted for only 2% or 3% of our revenue) were going to grow to be 10% or 20%.

**Aspray:** Very much what Microsoft did.

**Kapor:** Yes, Microsoft got this right; we got it wrong. They copied the Japanese in persistence and we were always starting and stopping. It wasn’t just me. It happened afterward. But then we started doing acquisitions. We did this product called *Data Speed* that was a wireless terminal that could get stock prices. We went into the data business. A lot of this stuff was Jim Manzi. I wasn’t driving this. We bought the assets of *Software Arts*, which was about to go out of business. A lot of people saw it as buying out the competition, but they were already totally dead. I was doing it so they didn’t have to go into Chapter 7 and be humiliated, and I thought they had neat stuff.

There was this product called *Metro* that was like *Sidekick*, but not as good; we didn’t stay with it and market it. There was *Lotus Express* which was a TSR (terminate and stay resident)

product, so you could actually run it alongside something else that ran *MCI Mail*. It was basically one of the earliest e-mail clients for a PC. *MCI Mail* was one of the first public mail systems. I was into neat products that did interesting things, without thinking about markets. We did a word processor- supposedly a scientific and technical word processor -- called *Manuscript* that Jon Sachs wanted to do. That was interesting, but there was no market for it. My favorite product was *Agenda*, which was the first personal information manager. I'm the principal designer of *Agenda*, along with Jerry Kaplan and Ed Belove. That was the last thing I did in Lotus. In fact, I continued doing it even after I stopped being chairman of Lotus. It came out in 1987 or 1988, and that actually is the kind of thing I'm working on today,

*Chandler, the Open Source Personal Information Manager*, inherits the spirit of *Agenda* because it did things you still can't do on a PC -- in terms of the flexibility of defining your own categories for classifying things, as a sort of a thought organizer. So those were some of the products we did. Let me say one more thing. I'm also the godfather of *Lotus Notes*.

Ray Ozzie came to Lotus Development Corporation because he'd worked with Sachs at Data General and then he went to Software Arts. We tried hiring him once and he wouldn't come. Then after we got to be somewhat successful he came to us with a deal saying: "I'll do the next version of 1-2-3, if I can then go and do my own project." So after he did *Symphony* -- he was the principal guy --. then he did *Lotus Notes*. We cut this very unusual deal where Ozzie founded Iris Associates Inc. to develop the first release of *Lotus Notes*, funded by, and under contract to, Lotus Development Corporation. We agreed that he couldn't do what he wanted to do inside Lotus. It would just get squashed. It needed to be separate, in its own environment, and we cut a deal based on trust. It took them almost seven years to get to market, but I'm the godfather of *Lotus Notes* and chartered that and oversaw it as long as I was there and protected it.

**Aspray:** What do you think of it as a product?

**Kapor:** Well, you know, in its day and age it was a great product. Ray and I have different sensibilities as designers. He is the ultimate systems and infrastructure guy; he is brilliant, and nobody had done something like *Notes* before. IBM bought it because they realized for every dollar of *Notes* sales, they would do \$9 in follow-on business. It was worth \$3 billion to them. But it had a set of problems. First of all, it was an early product so it assumed there were LANs and it assumed a GUI, and that stuff took a long time to come. It's obviously server-based and has a heavy administrative burden. I mean it suffers from being designed in 1984, and because it took so long to develop, it eventually became a kind of an albatross. It was perfect for IBM, and they repurposed parts of it and kept *Lotus Notes* going after IBM lost the desktop business to Microsoft -- and it kept a good part of IBM going, so it was highly successful. If you were in a Fortune 500 type environment, where you could have the support from the servers, *Notes* was great.

**Aspray:** I'd like to come back to ask about your criteria for judging some of these products. I'm not sure I can formulate this question very well, but you're a public company by this time, and you're driven by certain expectations of your shareholders about the volume of business you're doing with a particular product. Yet you have other products that you think are technically good; they meet a need, they're well executed, and so on.

**Kapor:** Well, the first thing to understand is that Lotus was known as a one-product company and at first that was very bad. We got dinged in the stock market. Oh, it's just one product. Then it got to be very good—"they own the spreadsheet franchise." And the stock price tripled. Wall Street, they don't know what they're doing. Really, I looked at it and said, "Efficient markets, forget it!" As long as we minded the 1-2-3 business, that was the most important thing. I was the CEO only through 1985, and the Chairman through 1986 -- and we minded the 1-2-3 business and we were the biggest software company at that time. So that was the important thing. But we had a very amateurish approach to determining what the next big thing was going to be. Well, let's try a bunch of stuff. We had theories about it but we weren't disciplined in a business kind of sense. The market was still maturing, so we could perhaps be forgiven for that. But in fact, one of those experiments turned out to be *Notes* and that added another number of years to the company's longevity, so you can't say that it didn't work. The other thing was, we were like golden and there wasn't the normal kind of scrutiny when people didn't know how this stuff worked. People didn't know what was going on. There wasn't any kind of sophistication.

I had the financial analysts calling up all the time about stuff, but they were just an enormous pain in the ass. But I think if I hadn't gotten out, I either would have had to get straight about this or just get out of the way. Having a focus or discipline and saying: "Here is what we need to do as a public company." I don't think I understood that for another ten plus years. So the point is that "the chickens never came close to coming home to roost." All these people were doing 1-2-3 knock offs and yet none of them worked.

**Aspray:** Why didn't they?

**Kapor:** First of all, technically, what we had done was a *tour de force*, so at a minimum, you had to be at least as good and it was very hard to do. Second, we just had enormous momentum. We had brand recognition and we were executing competently. There are a couple of things we did to piss people off, but by and large people were very happy with us; happy to pay the money and happy with the support. It was copy protection that was an issue. You know what we should have done, in hindsight now, is just done the same damn thing and said, "We're just going to do a super competent word processor, and we're going to do a super competent database, we're not going to try to get overly fancy; we'll have some good ideas in this thing and we're going to brand everything consistently."

**Aspray:** But there was so much interest in having a fully integrated suite of things. Right?

**Kapor:** Well we also thought literally that *WordStar* owned the word processing market. That was just a mistake. I made the same mistake again and didn't think the market was going to get to be 50 times as big as it was. I didn't do the math. I can't say anything else other than that.

**Aspray:** I'm mindful of your time. Are there a few things that you'd like to talk about that are closely tied to these issues, just to close out this story?

### **Merger Discussions**

**Kapor:** Not off hand. There are tons of things I could talk about though, although one thing I'll say is that we had all these merger talks with everybody, about everything, and they went on after I left. We talked to Ashton-Tate. We talked to Microsoft, and everybody talked about getting into bed with everybody else.

**Aspray:** Why didn't they work?

**Kapor:** Well, in my case I didn't want to do it badly enough. I thought about Microsoft: "It's in Seattle, it's a long way away, how are we going to make this work with that and this." Why do I want to do that? I mean it was sort of like I wasn't thinking in business terms.

**Aspray:** Why then IBM when it happened?

**Kapor:** Well, I was gone. I was long gone and it was a hostile bid. Manzi's first instinct was to resist it. I don't know if the board persuaded him, or just did the math or they talked to the lawyers and found how it was going to come out. They changed their minds within 24 to 48 hours.

**Aspray:** Were any of your board members particularly helpful to you?

**Kapor:** The board was kind of a disappointment. Alex d'Arbeloff was great. He was the CEO of Teradyne; he was an entrepreneur, he'd been around. He and I used to clash because I was sort of a young Turk and I didn't like to listen to people particularly if I didn't like what they were saying. But he was very smart about the realities of running a business. He gave me some good counsel when we started to be successful about how life was going to be different, good personal advice. So he was good. The other board members were neither here nor there.

**Aspray:** What precipitated your final decision to leave?

### **Life After Lotus**

**Kapor:** You know, I think it had been actually a long time coming. In fact I'll tell you a story. About six months before I left, and I didn't know I was leaving because it was a very sudden decision, a documentary crew came in and filmed a segment on us for a PBS documentary called, I think, *The Entrepreneurs*. It was about Steve Jobs, Suzie and Doug Tompkins from Esprit, maybe Mary Kay or one of the cosmetics people and me. The filmmaker was named John Nathan. I don't remember the exact sequence, but around the time I was leaving – after I'd made the decision to leave -- I saw a cut of the film and that's what the filmmaker had the story about. He had picked up from my body language and my relationship to Manzi that I was on the way out the door. So I would just say it was a secret – at least I had kept it a secret from myself-- that I'd felt progressively isolated, trapped; I was not having fun, and felt frustrated. I had big responsibilities, was scared of failing, and was thinking: "I got to get out of here." My lack of building a base inside the company, of creating people loyal to me - I'm kind of a conflict avoider -- and we were growing so rapidly. There were ultra-aggressive tactics in the sales force and some of the marketing I would have needed to just go and say: "Stop, stop it or you're out! We're starting over." I would have had to just assume command of this thing and I didn't want to do it. I felt like I would be miserable and I'd likely fail, so I said, "I'm leaving." I think that's what he wanted -- Manzi wanted me to leave. So without having to have him stage a coup, I did it for him.

**Aspray:** What did you want to do?

**Kapor:** Well, I didn't know. But I did have a great sense that there were lots of opportunities and possibilities. I had one kid, the other one wasn't even on the way yet. I went and I spent a bunch of time at MIT as a visiting scientist in the lab. I forget what it was called, the cognitive science laboratory and then a little bit of time later in the Artificial Intelligence lab. I love doing that kind of stuff. I started doing angel investing, which I like a lot, and working with other entrepreneurs. I wound up starting a second technology company, which was a classic second company syndrome: "Oh! Maybe the first one was an accident and I don't really have what it takes, so let me try to do something with even more grandiose goals at which I can succeed." It was like Steve Jobs did Next after he got thrown out of Apple, and only because he did this sort of radically new computer was he able to pull it off. But, of course, he did pull it off. So, after ON, I changed strategy several times, mostly after I was ejected from the company and ON lived for 15 years. It was ultimately acquired by Symantec, but it was the same thing in name only from what I had started. I wound up falling in love with the Internet, discovering a virtual community on the "Well," and as a result in 1990, co-founding the Electronic Frontier Foundation.

**Aspray:** Thank you very much for participating.