CHM Computer History Museum

Oral History of Jim Clark

Interviewed by:
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Marc Weber

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Hancock: Today is September 12, 2019 and we want to thank you, Jim Clark, for welcoming us from the Computer History Museum to capture your story, your recollection.

Clark: Sure.

Hancock: I'm Marguerite Gong-Hancock and I'm here with Marc Weber and we're here to start at the beginning. If you could then for the record, could we ask when and where you were born? Take us back to Plainview, Texas.

Weber: So let's just say it is September 16th. Just so we have that.

Hancock: Oh, I'm sorry.

Weber: Okay.

Hancock: I'm on the wrong day.

Clark: You want to start over?

Hancock: <laughs>

Weber: No, no. That's okay.

Clark: It's September 16th.

Weber: Just to get it in the--

Hancock: Yeah.

Clark: Yeah, I wasn't born in Plainview, Texas. I was born in Fort Worth, but my parents moved to Plainview shortly after I was born. And I can't remember much except for when I was maybe three or four, you know, and started being aware of my grandparents. But I went to public school there. Population 15,000, maybe 12,000 even. But during my youth it grew from 12,000 to 15,000. I went to a couple of different elementary schools as my parents moved around in the small town. And then ultimately, I was in high school. I played tuba in the high school band. And didn't play sports because I'd never been drawn to sports. I was more drawn to music. So, I played in the band, in the marching band so I didn't have to do physical education. Until I was a little bit of a problem kid. Really, was more mischievous, but it was a fairly intolerant time, you know, spankings and paddlings and that sort of thing when you misbehaved in school. Paddlings, literally paddlings.

Weber: At school?

Clark: At school, yeah. In the band, typically. Of course, I got a few paddlings and then eventually I graduated into high school where the band director was a lot less tolerant and he kicked me out of band.

Hancock: <laughs>

Clark: And maybe a year later, I was asked to leave high school for disciplinary reasons. Ironically, I suspect most of the things I did happen all the time now in some public schools. But, I left and eventually decided after being out of school for about nine months, playing cards at the used car dealership and generally a miscreant, decided not to go back when school reconvened the following year, I decided that since I felt lost and left out, to join the Navy at the age of 17. I spent just under 4 years in the Navy.

When I was initially in boot camp, I had never taken a multiple-choice quiz, and I marked several answers on a few questions. This is almost 60 years ago. They thought I had cheated on this quiz because I marked a couple of answers -- I thought they were both correct, right. So they said, "Well, we're going to send you to the "Fleet" for "on the job training". I seemed punishment for not knowing how to take a multiple choice quiz, before going to Class A school.

And in this little interval of about nine months I went through a whole variety of pretty dirty work. One of the things I did during that interval was I borrowed some money from a guy because I was short of cash. You know what, you didn't get paid much — $85/month, as I recall. And I think I borrowed $20 dollars or something and the next payday I had to pay him back $28 dollars. And that's where I learned, I guess you might say that's where I got my real on the job training because that's, that was my first exposure to finance.

Hancock: <laughs>

Clark: And I, I kept that locked away. I never did it again. I said, that's just, that's pretty harsh. But then when I got out of that particular tour of duty, I went to what's called the Class A electronics school. By this point I had learned that I'd-- I definitely learned that I'd done the wrong thing in joining the Navy and dropping out of school. So, I was just more focused and that first week of the school I-- they taught basic algebra and I "aced" the week -- I got the top score.

So they had a little program where they got some of the students to teach-- in fact that course, that night school, I should say, was taught by a former student who was ahead of me. So they asked me if I wanted to do that and I said sure. Taught basic algebra review. And so I took that assignment but the only-- that entailed four nights a week-- I mean, four nights, one week, Monday through Thursday night teaching and then you got the rest of the month off. So it was one week out of a month you had duty -- that was my duty. Instead of lots of other cleaning duties and things like that, my basic duty was teaching. And one of my bunkmates also got the same job and I had saved some money when I was in the "Fleet". I took my savings and started one of these loan funds.

Hancock: <laughs>

Clark: With the proceeds of my loan business I made a lot of money, and I paid my bunkmate to teach my class! So I ended up doing nothing. That's my first little foray into business. You might say I was a loan shark, I guess.

Hancock: <laughs>

Clark: So I did that the whole time I was in the school and I came out top of my class. So I learned that I was able to at least do better than 25 other guys and I got choice of duty station. I moved back to Norfolk, Virginia and I got on a ship which did all sorts of touring of the Atlantic and Mediterranean and Norway and places like that. It was, you know, a destroyer, a guided missile destroyer. I didn't do any more loan business, but I started taking a lot of correspondence courses to kind of remedy my lack of education — American history, plane geometry, sophomore and senior English, just remedial courses.

But on this choice of duty station ship, there were thirteen other guys in my rating — so many that they, we had an overflow. They ended up giving us menial labor, cleaning, boiler room watches, machine room watches, etc. Because there were too many of us and they needed other people doing some of this menial labor. So I wasn't real happy with that. I kept requesting to get off the ship, but requests were always rejected. We were labor in servitude.

Near the end of a year and a half, I met this personnel guy who worked assigning crew to various ships in the Atlantic Fleet. He said, "Look. If you insist, they must send your request all the way up through the chain of command and send it off the ship; it will come to me, and I will get you off the ship." So, I did that and sure enough I got an assignment to move to a reserve training ship where I was the senior most guy of my ranking -- it was just a little destroyer escort docked full-time in the Mississippi River in New Orleans. So that was a fortuitous thing. From there I took night school courses in calculus and finite math and English at Tulane University.

Hancock: So what was-- You left, you dropped out. You ended your high school time as a junior. And what was guiding your own pursuit of what you were studying? You were shaping your own, you know, classes that you were taking. How were you--

Clark: In high school?

Hancock: No, I mean, in this later time, how were you choosing what you were going to be studying? You were shaping in a sense your own education.

Clark: Well, I was basically taking what I thought was necessary. I mean, English, history. Finite mathematics was kind of a set theory and things of that nature, finite math combinatorics. And so, I just felt that was a good thing and I took that. And then I thought, well, calculus is -- I wanted to be some kind of scientist, so I took calculus. So January of '65 was coming and there was a program where if you got accepted to a college you could get an early discharge. So, I applied for that program, got accepted and then I got discharged — I think it was three months earlier than I would have. So, I left and moved back

to my home in Texas armed with three As in college and started to Texas Tech. But I was married and I had a child.

Hancock: Oh.

Clark: And I was-- Yeah, during this time I got married and I needed a job. My parents certainly couldn't afford to put me to college. So, I started going to Texas Tech and working for my uncle. And then I got a job at the fire department, all this time working full-time while going to school full-time. Eventually I got tired of not being able to go to afford to go to school, so I contacted the guy who had taught me calculus at Tulane, I was his top student, so he offered, he said, "Look, after you get a few years education, write me and I'll hire you at Boeing."

Boeing designed the first stage of Saturn V moon program out of a place called Michoud, Louisiana and they built the big Saturn V first stage there. Boeing was in charge of that. Chrysler was in charge of the second stage. I kind of dived into the computer world pretty fervently. I was, like, always pretty focused on things like that, any kind of technology. The guy who had worked there was sort of my partner/supervisor, well, he resigned shortly after I came there and took another job. There was a computer that was heavily used 24/7. I made friends with the computer maintenance engineer for that computer. He was an older guy and he showed me how to key in instructions and--

Weber: What kind of computer?

Clark: It was a GE-235. It had a card reader. It had a bunch of tape drives. And sitting off in the corner was an unused disk drive that was new and had never been installed. So I was watching this computer being in operation literally 24 hours a day. It was just always in a backlog. And I was talking to the maintenance engineer and he said that that disk drive would speed it up a lot but no one had ever put it in use. And so I sat down and read the manual and learned how to use it and I took the program that was taking all this time and I began to alter it -- my own little copy of it -- to use the disk drive.I didn't know what it did, but I made this program do the same thing that the tape drive program was doing. It was creating analog valve cycling sequences to just make sure that the rocket opened all valves and let in fuel and so forth. And they tested it and said it worked. And suddenly it went from being used 24 hours a day to 4 hours a day. Boeing was quite happy with me after that and they just said, "Look, you just come in and do whatever you want." I did that for the next two years — basically did homework from school.

Hancock: <laughs>

Clark: And that's when I began to really dive into physics. Prior to that I was studying physics, but to be honest, my grades weren't so good because I was heavily involved in learning computer programming. But once I got freed of sort of work responsibilities of any significance, I started studying and spent the next years getting a bachelor's degree in physics.

Then I quit, got a fellowship and entered graduate school studying for a PhD in physics. But by 1971 I noticed in *Physics Today*, which was a magazine that physicists read, had an article that observed that

physicists getting PhDs from places like Harvard, MIT, Yale and so on, didn't like the jobs they were getting. And I thought well, what am I doing — I'm getting a PhD in physics from Louisiana State University! Also, by then, I was trying to get my degree done, but every time I would finish my advisor would pile on more work -- he didn't want to be embarrassed by letting me get a Ph.D. after only a year or two. And I kept thinking, well, I'm married and I've got these obligations. By this time, I had a second child, so, I was real eager to get a good job and I just got discouraged about physics. And a friend of mine pointed to University of Utah as having a computer graphics speciality. I didn't know much about it, but I was good with geometry and physics, which involves a lot of geometry.

Weber: But had the job prospects and the program worked better, you enjoyed physics as a subject. You would have been happy to continue.

Clark: Oh, I very much loved physics as a subject but I didn't think I was going to be able to get a good job.

Weber: Okay, but it was the practicality not the topic.

Clark: Just the practicality of that. So, this is when computer science just sort of emerged as a real discipline. A guy named David Evans who used to be the Chair of the Physics Department at UC Berkeley, was a Mormon and he had been convinced by the University of Utah to come to Utah and start a computer science department.

And this is all fortuitous for me because Dave was a brilliant guy, a really nice guy, and he had in turn convinced Ivan Sutherland, Chuck Seitz, Tom Stockham, Tony Hearn -- these were truly brilliant people — to come start this department. And so, I just fell into it really. I just wrote my thesis for a master's degree. Moved to Utah. Dived into that. Kind of took up with Ivan Sutherland. Worked a little bit for Evans & Sutherland Computer Company to make a little extra money.

And it was one of these things where I never envisioned myself able to go to a place like MIT or Yale or Harvard or any of these, you know, "Ivy League brand name" schools. By the time I was in graduate school I had made all A's, so by going to Utah, I kind of kicked myself up into a different orbit. Oddly, if I'd had the money, I would have been accepted in those brand schools like MIT, Princeton, etc, because of all my academic work being A's. So I got into Utah with no problem and had the advantage of studying under people who'd just left those schools anyway. It just turned out to be very fortuitous that here I had all of these people who were from all of these schools that I would never have tried to get into.

Weber: That was the world center for graduate--

Clark: As my instructors. So, it was really kind of the best of all worlds. A new department. A new discipline sort of, computer science. I had already made my chops in computer programming, so I was no-- I was no slouch at that, I just fit right in and I learned how to design hardware. Chuck Seitz was a great inspirational hardware instructor -- I still recall I came in, he was my kind of my freshman advisor. Even though I had a master's degree in physics, they made me go back and take these freshman

courses. And I still recall Chuck saying to me, "You really ought to take this course. It's called Introduction to Computer Logic." And I thought, "It's a freshman course." I mean, I was taking it as a first-year graduate student, and I already had effectively a PhD in physic! There were 230 students in that class and I came out top of the class. After that, he said, "Well, maybe you can just be a-- you can learn it while you're a teaching assistant." So I became a teaching assistant for the course and learned it along the way.

But I did learn a lot through Chuck, it's just that I didn't need to be an official student to be learning it. But I learned a lot in the computer labs building hardware and Chuck had these phenomenal labs and I learned a tremendous amount. I was always in complete awe of Ivan Sutherland. He's a brilliant man, obviously. I mean, he's probably in his 80s now, but — I'm 75-- and he was just about 5 years older than me. But his lucid style of thinking was kind of an eye opener. And Chuck Seitz and the way he described things, you know, quite an eye opener. And Tom Stockham, the guy who invented the world standard digital recording format, and his image processing activities. You know, I never took any of those courses, but I kind of learned them all by osmosis. I mean, learned the image processing stuff and signal processing and--

Hancock: Were there any--

Weber: And Bob-- Oh, sorry.

Hancock: I was just going to say, were there any particular occasions or conversations or projects that you were working on that kind of stand out from that time with any of those people or from--?

Clark: I didn't do anything particularly significant with Tom Stockham, but there was a group of people. Ed Catmul was there. Bui Tuong Phong who a few years later passed away from cancer. But, you know, we had, there was just a community of guys trying to do the next new thing in computer graphics. And Ed was more interested in computer animation and so was Ivan back then.

In fact, Ivan started a company then called the Electric Picture Company and Ed was going to go join him. I think they even tried to raise money to form a computer animation company. And I don't recall the economics of the times, but I think they just couldn't raise money. So Ivan kind of-- this all happened over a period of three years. But during that time, I made digitized copies of the aircraft carrier Enterprise and was thinking about making an animated film. I made a little 3D model of Snoopy flying a Sopwith Camel. And it was, you know, have him take off and land on the aircraft carrier.

I was quite interested to some degree in computer animation, but then I instead kind of got more drawn to hardware, more drawn to this head mounted display that Ivan had been part of-- had built as part of the DARPA funding. And he had built that at Harvard prior to coming to Utah and moved it. It was just mechanically connected to the room but it was cool to be able to put that on. And that's the first of virtual reality if you will.

Weber: It is.

Clark: Yeah.

Weber: And you know, we have it in the Museum.

Clark: Yeah.

Weber: Yeah. But you were involved directly with that. I mean, it was already built several years before.

Clark: It was built. Yeah.

Weber: But you were using it. Did you come across the-- Larry Roberts had the Lincoln Wand that was like a magnetic wand that was meant to work with that I believe.

Clark: Well, I know there was the thing called the Lincoln Wand. But what we had, I don't think that ever, if it was wireless, I don't think it ever worked. At least it never got moved to Utah. What did work was three attachment points on the ceiling with monofilament line coming down to the little thing that you held in your hand and as you moved it, those three fishing lines would change length and there was a shaft encoder on those to detect how far you were from those three points. So you could calibrate that and work yourself around in a little space. So, it had a 3-dimensional wand. It had buttons on it. It had the head mounted display, the two little CRTs.

So I built a B-spline surface design system for interacting with these services in real time. So, it was a combination of computing, dealing with these modeled surfaces, bi-cubic surfaces, primarily. And you could have this big large sheet and it was more of an interactive modeling PhD I look back on it and I think it's like a lot of the other PhDs. in those times. It was a new field and people were accepting a lot of different things as unique. When I look back on it, it doesn't seem very innovative or unique. But then on the other hand neither was Phong shading and neither was Gouraud shading.

Hancock: <laughs>

Clark: Probably the most unique thing done then was what Ed Catmull did with subdividing surfaces to a the size of a pizel. And there were things evolving out of that. MIP mapping, you know, mapping textures onto surfaces. The kinds of things that are routine in games these days were predominantly all invented then, with specular reflections and things of that nature, environment mapping. That was all kind of done back then. And a lot of that came from Ed Catmull, but I was involved more in the hardware side of things to a large degree. I left.

You know, here's a high school dropout from Texas who never went to a brand name school. <laughs> And I just, I can't overestimate the difference University of Utah and Ivan and Chuck and all of those people made in my life. It was like you're suddenly introduced to people who can open doors for you. I would have never gotten a job offer from U.C. Berkeley or U.C. Santa Cruz or probably would have never thought of even trying. But Dave Evans was on my PhD committee. He had been a professor at Berkeley and he was ready to offer high recommendations and so was Ivan and Chuck. So I was super lucky. You

know, life is one of these set of lucky events and you've just got to be able to take advantage of them when they happen, or even be aware of them -- to grab the ring <laughs> as you go around. Because that's how I feel. I feel like it was extremely lucky for me to be able to land in Silicon Valley for the most part. But I went to U.C. Santa Cruz. I was a bit of a hippie and I felt that would be a good place to go.

Weber: Sorry, one last thing.

Clark: Yeah.

Weber: With Utah, so that was also a Center of Excellence for ARPA, right?

Clark: For what?

Weber: ARPA had made Utah like a Center of Excellence or something like that..

Clark: Well, yeah, they're-- There were initially four, five, six nodes on the ARPANET.

Weber: But also, the graphics, I think they had given it a special status.

Clark: Because of Ivan. Yeah.

Weber: Yeah.

Clark: Ivan and-- Yeah, it became a focal point for graphics. So graphics with Ivan and Dave, image and signal processing with Tom Stockham, LISP with Tony Hearn, hardware systems with Chuck Seitz -- all these other people there mad the place unique. You know, it was an enormous gift to Utah that Dave brought there, I think.

Weber: It was also obviously on the ARPANET very early. Did you use the ARPANET and did you feel connected to the larger kind of ARPA community?

Clark: Bolt, Beranek and Newman had built this hardware router that connected us to the ARPANET and it was a huge cabinet, today relegated to a chip. But it was like a huge cabinet of-- And we were one of four, five or six places, along with Leonard Kleinrock at UCLA

Weber: Oh, yeah, UCLA. [29:00]

Clark: UCLA but--

Weber: Network Measurement Center.

Clark: More S-- SSU--

Weber: Oh, ISI.

Clark: ISI, yeah, Information and Sciences Institute.

Weber: Yeah.

Clark: They were a node. We were at Utah. Maybe Caltech, I don't remember, but.

Weber: SRI.

Clark: No, it was up in Stanford, probably was, I don't know.

Weber: Well, yes. Stanford Research Institute.

Hancock: SRI.

Clark: SRI, could have been. But Carnegie Mellon, a few places. Ivan had been a Director at ARPA at the age of 21 or 22 or something crazy like that. I was just starting to college at 21, he was already Director of DARPA.

Hancock: <laughs>

Clark: But he helped seed, helped be part of seeding all this stuff. And frankly, the fact that they were all at Utah made a huge difference. And so, they were one of the nodes, one of the early nodes in the ARPANET. Did we use it? We started using it for messages and email, I guess. Was I aware of it? Not terribly at that time. It was a big box that sat there.

But I was worried about getting a job. <laughs> Remember, I mean, I had two kids and I just wanted to get out, get a PhD and get a job and so I did and then I moved to California. And I spent four years there. Very frustrated because I felt like I was kind of out of the mainstream, you know, I should have been at Berkeley. I confess, I made a mistake. Even though U.C. Santa Cruz was a nice place and had a great faculty, I basically at the end of 3-1/2 years was just frustrated because of a huge teaching load. Teaching is important, but you know, a young faculty member is not going to be judged very much on how they teach, they're going to be judged far more on how they produce research. And so that was the dilemma of being there. I just got frustrated and I quit and moved to Berkeley. Manuel Blum, a very nice theoretician computer scientist there had been the Department Chair when I had applied and I had maintained contact with him-- when I had originally been offered the job. And he said, "Jim, I'm quite certain you will get a job offer." But evidently, the head of the Engineering School didn't like the fact that I had turned them down the first time for Santa Cruz. And you know, they didn't take me. So, I said, <laughs> "Oh, well." So I moved to where Ed was. Ed Catmul was out at, out here in New York, actually, at New York Institute of Technology.

Hancock: NYIT, right, mm-hmm.

Clark: I got married and spent the better part of a year-- remarried, I should say-- I spent the better part of a year trying to build a 3D digital sampling system where you could essentially record some key points in a person's body as they moved and then map those onto an animated figure. The idea was to do computer animation. All of that gets done routinely now, but I was building a system for that. But Alex Schurr, the guy who ran that place who was a bit of a nutcase and he would-- He was like Khrushchev. He would come in and beat his shoe on the wall, you know.

Hancock: <laughs>

Clark: And I just remember thinking, "I'm trying to build my career and how is this going to work out?" And it turns out he was spying on everyone. I wrote Dave Evans and asked him if I could get a job. I said, "I'm going to finish this project, but I don't want to work here." And he was spying on me and he fired me for doing that.

I was extremely upset at being fired, so I went back across the country and met up with some people at Stanford, and fortunately another great fortune in my life was to meet Forest Baskett. Forest and I became very close friends. He was just out here with his wife, spent the weekend with me and my wife at our country house about a month ago. We became good friends in large part because over the years, we just worked together on these things. He eventually, well, I'm getting ahead of myself, but he even came to work as head of R&D at Silicon Graphics, which was my first company.

But what Forest did was convince Stanford to hire me. And so, I became an associate professor at Stanford. The first year that I was there, that summer, I went to Xerox PARC where Lynn Conway was. She was teaching the VLSI course that she and Carver Mead had written a book for. And you know, I attended that two-week course and I came back super inspired. I started teaching that fall, working the hardest I've ever worked I think because I was trying to make up for lost years. I felt like I've got so much I've got to do. And I created this thing called a Geometry Engine which was a novel way of putting integrated circuits to work building a computer graphics engine. And, yeah, and I taught 160 graduate students, which was a big challenge, teaching computer architecture, like I'd learned from Chuck Seitz. But the way Stanford wanted you to teach it involved a lot useless techniques such as Klein-McCluskey minimization of gates, because I could see the integrated circuit design taking over and you're a lot less concerned about gate minimization. Yes, it means something, but it means a lot less when you're talking about gates on an integrated circuit. But a Klein-McCluskey minimization and McCluskey was a faculty member there, a great guy, but you know, I went in and I just refused to teach that stuff and so I taught VLSI to my logic course.

Weber: Were you using or involved with the MOSIS thing for that Danny Cohen was involved with for what it was, you could send your design and have it prototyped?

Clark: Yeah, rapid prototyping. He got involved with that later. Danny became a really good friend of mine, a great guy. That's how I met Leonard Kleinrock and those folks because he was down at USC ISI, and UCLA. But they started that rapid prototyping thing after that--

Weber: Oh, okay. All right.

Clark: That summer.

Weber: Got it.

Clark: By the way, the year I graduated from Utah, Chuck Seitz and Ivan both took faculty positions at Caltech. Dave stayed in Utah, but two of the guiding lights moved.

Hancock: It's just that window of time when you were there--

Clark: Yeah.

Hancock: When there was this constellation of people. Is it right that you were office mates, too, when you came to Stanford with John Hennessey, is that right?

Clark: Mm-hmm.

Hancock: Speaking about the other people--

Clark: Yeah.

Hancock: That became relationships that were important later.

Clark: Yeah. Forest hired me. I landed there. John was an assistant professor first year there, I think. And we shared a secretary. And over the course of the year, as I did the Geometry Engine, I needed help. I needed a microcode compiler and John wrote it and he worked along with me. He was teaching his classes; I was teaching mine. John and I became really good friends. I eventually even convinced him, if my memory serves me properly… I was so enthusiastic about integrated circuit design that I told John. I said, "You know, you guys that are computer geeks should, computer architects should build a CPU on a chip." And that's where the MIPS design came from.

But he and I, before I started teaching and a guy named Skip Stritter, who was visiting from IBM, started teaching this course on CPU architecture and they wanted to build a pipelined architecture. Essentially, it was a set of things that weren't hard to understand, it's just that I was doing all this other stuff. And I rapidly faded from teaching that. And Forest, by this time, left and started to work for DEC as their Vice President local R&D guy in Palo Alto. And DARPA, because of the work I had done on the Geometry Engine, they just asked me to be the PI, Principal Investigator, to replace him. So I kind of nominally took that over, but John and I were doing that. By this time I had taught a total of 360 grad students in two semesters. I told Stanford I wasn't teaching any more that year.

Forest left and I don't know, a couple of years go by. And John had done the MIPS project as that class, they began and they created the MIPS architecture. Meanwhile, I was winding up a set of graduate

students and convinced them to start a company. So I wrote a business plan, presented it to some venture capitalists, got some funding and we bailed in '82. I convinced these guys to join me. These were grad students getting PhDs, some of them-- two of them. One was a math PhD, Tom Davis. He had already gotten his PhD But we all left and started the company.

Weber: And there were no IP issues with Stanford?

Clark: There were none because they exclusively licensed everything to me that I had done. It turned out that license wasn't really necessary. We redesigned the Geometry Engine to be more discrete using gate arrays and never actually used my design. And so, a year and a half go by and we finally introduced the product. Meanwhile, John is thinking about what to do with MIPS and I told him "You should go start a company to build that CPU. We need something better than the 68000 at SGI." Meanwhile, SUN was developing the SPARC architecture.

So, John went out and created MIPS. We licensed the design and started incorporating it and eventually bought the company, Silicon Graphics did. And John went back to Stanford, and all during this time Forest eventually became the head of R&D at SGI. That was an intense time of my life. It was all of my education seemed wrapped up in Silicon Graphics. It became the leading computer graphics company for sure, making workstations. And you know, I worked my way through that for quite a few years. As it turned out, it was a bad business thing for me.

Hancock: <laughs>

Clark: Because I didn't make--

Hancock: Before we get to the bad part of the business, if you could tell us on the front end a little bit more -- sort of the essence of your business plan -- what you saw as the business opportunity and then the funding, which turned out to not be the ideal situation. But if you could tell us sort of the technology that you were-- You've talked a little bit about the Geometry Engine, that you were shifting the business model and then the funding, how all those came together with your essential team.

Clark: Well, I remember I actually was good friends with a woman named Ronnie Goldfield who had been married to Frank Caufield of Kleiner Perkins Caufield & Byers. So, she was acquainted with startups, and I was trying to get this thing off the ground and didn't have any money. She loaned me $150,000 which became stock or it was essentially a bridge loan to get-- or seed funding, if you will. And I eventually through her, I think, met Glenn Mueller and Mayfield Fund. I also met Don Valentine, Pierre Lamond of Sequoia.

Hancock: Interviewed both of them. <laughs>

Clark: And I think what happened is… You know, I wasn't a business guy and I picked up a guide to writing a high technology business plan. So I just followed that and I wrote a business plan. And I created a slide deck and hired a couple of guys to be the officers. The CFO had been the CFO of Dreyer's Grand

Ice Cream and I figured, well, he'd been a CFO, that's good enough. He didn't know anything about cost accounting, but….

Hancock: <laughs>

Clark: He came in and I got a guy who had worked setting up manufacturing facilities for computing products and Abbey Silverstone…. And I got …. who else? I don't recall the rest, but we went in and presented this business plan and created a slide show. I remember still I didn't know what a balance sheet was, but I presented this pro forma balance sheet, right. And I remember the-- I think it was Don Valentine just sort of, "Where's your proforma and balance sheet?" And I couldn't bear to tell him I didn't know what it was. I think he knew, because they didn't eventually invest.

But then I met, you know, Glenn. Glenn was a great guy. He was a good friend. Grant Heidrich was a partner also. Those were the two key guys. They came on the board. But <laughs> I guess in part because I wasn't a business guy, when they offered me… I think it was $800,000 dollars for 40 percent of the company. And I took it thinking it was better than nothing — and perhaps it was.

But over the years they were on the board. We did a Series B. I met Dick Kramlich and he came on the board. A guy named L.J. Sevin of Sevin Rosen also invested in Series B. So, you know, I was in kind of in the big times. They're all good people, very good people. But over the years as that kind of unfolded, the company raised three or four rounds. I mean, it was a manufacturing company, a computer company. It had to build a direct sales force. It was a significant undertaking. It took a lot of management. We ended up going-- We had one CEO, Vern Anderson was his name, who's since passed away. But Vern wasn't really that kind of guy, a computer company guy. So we ended up-- I've probably used a search firm and we found Ed McCracken. He came in, he was an HP guy, and he hired some former people from HP. And we got up and going and we had a sales force and we just, you know, started selling and started doing well. We were the leading computer graphics company in the world. Which I will say kind of irked Ivan.

Hancock: <laughs>

Clark: Because Ivan … I remember Ivan told me one time, he says, on the Geometry Engine he says, "You realize you violated every patent Evans and Sutherland has." And it was a kind of a deflating comment coming from him.

To program, we created a thing called the graphics library, and that was a tool that, frankly, a person named Martin Newell and I had created in the process of teaching. And it was bit of me copying him and-- because Martin was a good, very close friend of mine and a partner for many years, and we were going to always start this together. He ended up spinning off and joining some CAD company in Chicago, but Martin and I had created the graphics library jointly. We just created a set of tools for teaching people how to program graphics, and it involved a certain way of dealing with the software -- because that's what we used, right? Software to teach people computer graphics. And I had used it teaching my graphics classes at Stanford, and it just naturally was what we developed to drive the graphics at SGI. And that became known as the GL, graphics library. And then Kurt Akeley, one of the founders of SGI, worked really hard

to turn it into something called OpenGL. By then it was incorporating all kinds of fancy shading and mipmapping and environmental texture mapping and all this stuff. So, it had a lot of the elements that are now built into every graphics chip set and device out there.

But over time, I kept saying to the management of the company, "We've got to produce low-end products. This is not-- the world is going to eat us from underneath." And I cannot really overestimate the difficulty of getting a company to change course… As it turns out, when we first started, even though it was Silicon Graphics, our first workstation was like $75,000. And the thing that you shouldn't overestimate is once you start at a particular price point, you build an entire sales force, all the commissions, the whole business model -- everything about the business… You get seduced by gross margins. But the world is fighting the battle down below, and here we were, fat and happy, getting huge gross margins and I kept saying, "We got to move down, got to move down."

And it is truly ironic because to complete that story, 12 years later I said, "I've had it. I can't do it anymore." It was driving me crazy. We're going to get blown out of the water someday, and I don't want to be here. That's what was going on in my mind. Nothing to do with the Internet, nothing with Mark Andreessen. I didn't even know who Mark Andreessen was. I was just basically worried. I was known as a bit of troublemaker at SGI – guilty! Because I was trying to get things to move down market. So that's why I left in total frustration. I just said, "I got to get out of here." I didn't want to be there when the place started falling apart. And I was convinced it was, because I thought this high-end focus was not going to work.

And after I left, and had already started Netscape, they actually bought Cray Computer, so that tells you the mentality of Ed McCracken and all of the other management were just seduced by us having the most high-performance computer in the world. Meanwhile, I didn't care. I was gone. <laughter>

Hancock: Can you help paint that-- go ahead, Marc.

Weber: Well, I was going to ask -- just because you say it went way back to the beginning of SGI -- you wanted to go down market. Had they done what you recommended, what direction would that have been? And also, Sun seemed to have some of the same issues, but as <inaudible 00:54:36>...

Clark: Yeah. T.S. Eliot wrote an interesting poem called "Burnt Norton" in which, a memorable line is, "What might have been and what have been point to one end, which is always present." Basically, you you never know what would have happened. But in my mind, SGI and Sun were destined to run into the PC market and fail. Had we aggressively gone down-market, we might have survived. PC was getting stronger. But in retrospect, with benefit of hindsight, I can tell you the people who benefitted from what we created, but we didn't.

And this is continuing that story of the apogee of SGI which happened during the dot-com boom, right, '96, '97, because I left in '94. What happened was McCracken left. I don't remember the details. I wasn't there. Tom Jermoluk left. Forest Baskett left. I wasn't even in touch, so I have no idea. But Bob Bishop,

who was the international sales guy, took over and they weren't doing well. They were going down, and he sold the high-end graphics division to NVIDIA. If we had had our wits about us, I believe...

Weber: It would have been Nvidia...

Clark: that Silicon Graphics would have been in silicon, yeah, as opposed to a workstation business. But it's sort of an idea that they benefitted from all the work we did -- all of this OpenGL, all of that, making the hardware run efficiently and making it available in chip form. So yeah, Nvidia is a couple-hundred-billion-dollar-- $150 billion-dollar company, and we never were worth even a tenth that. And it's surviving, and it's mutated. Nvidia has mutated and taken advantage of machine learning and … The main thing they took was a bunch of really smart people. SGI was renowned for having super good, high-quality engineers and thinkers. So in any event, I branched off and left, right, while that continued and happened and-- but that's my story. I believe they could have been Nvidia if they had had a low-end focus instead of a high-end focus.

Weber: But back in the mid-'80s, say, were you thinking to go head to head with PCs or-- I mean how-- when you say "low-end," what would that have looked like?

Clark: I was worried in the early days of SGI about our price point compared to Sun. But Sun encountered the same problem vis-a-vis the PC that we would have encountered. It's just that SGI had this graphics knowledge. You can think of the intellectual property of SGI was largely in its graphics. We had a CPU. We had MIPS. Sun had SPARC, right? All of those are as they are. But we had this-- we were uniquely knowledgeable about graphics, even more so than Evans and Sutherland. They had kind of stayed in the flight simulator business and we had this knowledge.

It's just that there was no one there to apply it to integrated circuits and truly build accelerators for PCs. That's where Nvidia got going. They started building graphics accelerators for PCs. It was the intent. We'd have probably never done that, but in retrospect, that's what we should have done. We started as a workstation company because Sun hired Bill Joy, and they made the original 68000 board that we used, that Andy Bechtolsheim had designed. We used the same board and Sun suddenly had UNIX running on it and it was a little workstation. They were selling $5000 products. Even they couldn't beat the PC.

See, we used to laugh. I will say here to Bill Gates, I guess, cheers. Bill Gates had the entire hardware side of his world beating their brains out to try to get costs down, competitors of the vendors and the hardware, and he had the operating system. So, I think we looked at that as a toy and even to this day, you look at DOS, it was a toy compared to UNIX. But the PC won those wars and it continues to win them. And that's just the way it is. And the graphic accelerators are common, even companies that Nvidia competes with, obviously, that do the same thing, AMD. There's a number of companies that do, but it's hard to construct what might have been. It has already, and it-- and I don't really much care. I'm very grateful that this thing has all that kind of powerful graphics, so as it turned out, I got together with Marc.

Weber: Wait.

Clark: You want to back up?

Weber: Okay, and then, well, the telecomputer. Do you...?

Hancock: Yeah, we...

Weber: Did you have a question you wanted to ask, but...?

Hancock: Well, actually I was going to ask about putting this in a PC context. You already answered the question I didn't ask, and then all-- the telecomputer, you were looking at all these communications and all that. Do you want to talk about that before we get to...?

Clark: I remember the term "telecomputer," but I don't-- that doesn't stick with me.

Weber: Well, because-- and this is from the Michael Lewis book, "The New New Thing," but he talked about you did a pretty major project to build the black box for the interactive TV. You had written a paper called "The Telecomputer."

Clark: Oh yeah.

Weber: You were outlining pretty much what we do now with the encyclopedias and books and shopping and banking and all this.

Clark: Well, let's back up. I wasn't quite that visionary. <laughter> Let's-- what we did at SGI-- in my last year or so was….I had the idea that the network was going to be the cable system. The Internet, per se, in those days was the ARPANET, and it was mutating into what we now know as the Internet, but it was still kind of the ARPANET. It was used predominantly for email and I wasn't that attuned to the Internet per se, but I was attuned to the idea. And in fact, I was promoting the idea that set-top boxes were going to be powerful computers that could play games and all sorts of things like that. They were going to be connected on a network. You could play network games. There was going to be a high-speed network… That cable system had the capacity to carry digital network data. Honestly, I wasn't thinking of the Internet, but it was the Internet. It had the capacity to do all of the data transfer… That you wouldn't use analog TV channels anymore. There would be data traveling over those channels, and so I was thinking conversion from analog to digital video and digital TVs.

Weber: And sorry, I assume coming from a graphics background, the idea of that had the bandwidth that you could have done serious graphics over the cable network. So, I presume that was part of the interest. I mean, the Internet, if you thought about it at all, was way too slow to do the kinds of multimedia things that...

Clark: Yeah, the Internet was still, in those days was slowed down by the way it worked. Typically end users got access over a modem, not a cable modem but <makes beeping noise> those things that made all the handshake...

Hancock: <makes sound>

Clark: Yeah, that kind of stuff, 1200 baud and then that wasn't even in my thinking, but high-speed bandwidth, high-bandwidth capability of the cable system was on my mind and, to some degree, fiber. So, I met with some people at Time Warner and, in fact, a guy that-- running Time Warner Cable now, Glenn-- I'll think of his name in a moment. But there were people that I met within...

Weber: But Jim Chiddix...

Clark: Jim Chiddix was the engineer, but this guy was a manager, Glenn Britt. I think he's the president of Time Warner now or Time Warner Cable. But in any event, I met with them, convinced them that we should do this thing. Convinced SGI to work with them. I convinced Nintendo that they should build a 3D capability into their game boxes. We did a deal with Nintendo. We did a deal with Time Warner. Those were all my initiatives. I was a prime mover of those. We built the Time Warner Cable project in Orlando. It was an experimental thing. It was 5000 homes, I think, where the set-top box was SGI.

Hancock: Set-boxes, right, were the...

Clark: Yeah, yeah, and then it all got going, but that wasn't-- and that's where my interest was. Networking via cable systems, games over networks, real-time interactive games, multiplayer games, that's how my head was working.

Hancock: So is...

Weber: And did...

Hancock: Go ahead. I was just going to maybe when we finish I want to ask about your finishing of SGI. But are you going there? Are you still on this?

Clark: Well the...

Weber: You had originally wanted to spin off a company to do that, but then SGI wanted to keep it in SGI, right?

Clark: Maybe. It wouldn't surprise me that I wanted to do something like that. It also wouldn't surprise me to lose interest in it because SGI wanted to keep it. I just eventually got very frustrated and, as much as any part of the reason was because Ed McCracken never had-- he would just as soon I didn't exist by this time. He wanted to be the chairman, CEO, didn't want me. He wanted me to stay on the board because it would be disruptive for me not to, but he and I were enemies. I just didn't like him, and he didn't like me.

Weber: Yeah, Louis said he took your picture out of some-- out of the annual report, or I mean it really got personal.

Clark: I don't know. I don't remember that, but I remember one time when we first hired him, I thought my daughter kept having trouble with his name and she kept thinking of it as McMuffin. And I just thought that was so funny, so I had his secretary make up a name plate, "McMuffin" instead of "McCracken," one of those name plates you slide into...

Weber: Beautiful. Yeah.

Clark: Yeah, so one day we just slid it in and it sat that way for a week and suddenly it disappeared. And I asked her about it, and she said, "No, he never said anything to me." But...

Hancock: So how did...

Clark: ...quite a few years later, we had a major staff meeting and I brought this up and people laughed until they saw him turn red. And then he said, "Some people don't like it when you make fun of their names." And everyone just went, "Oh my God. Come on, lighten up." But no, we didn't really get along. So when I finally left -- I was to the point that I just couldn't take it any more -- my wife told me, "All you ever do is bitch. Just leave and start a new company. You started one. You can start another," and it kind of hit me in the head.

Hancock: So how did that feel? I mean, this was your idea. This was your team. This was your...

Clark: My whole life, to be honest with you...

Hancock: ...life, right?

Clark: ...and it had been invested in making this company.

Hancock: And for you...

Clark: Didn't feel good.

Hancock: Yeah, so what was it...?

Clark: But I had lost all kinds of control. I didn't own more than about 2 percent of the company after 12 years, and probably McCracken made more money than I did out of it. But I just looked at that and I didn't like… It bothered me that Glenn Mueller was on the board and he knew it, knew the history and yet they didn't do anything to get me more stock, didn't do anything to help me out. So yeah, when I left-- in fact that's a part of Michael Lewis's book. Glenn wanted to invest in Netscape, and I said, "Glenn, look. I'm going to do this on my own. I'm going to be the sole series A investor. I don't want any venture capitalists involved, and sorry, but I'm just not going to do it, not going to let you invest." And he was going through-- and he had some demons working in his head at the time. And eventually, unrelated to this, I'm quite sure, he committed suicide. It was hard on me. It was really hard on me because I felt guilty, that I was partly responsible for that. But time went by and...

Weber: Because you had been good friends with him at one point, too.

Clark: I had gone to stay at his house in Lake Tahoe. I had been skiing with him. A lot of those years, I was a single parent. I'd take my daughter with me to go skiing with him and his family. We were friends. I never felt like heartfelt friends with him, but because he was kind of at a different station in life. He was an investor, and I was just a mere engineer, entrepreneur.

Weber: Investee.

Clark: So-- huh?

Weber: Investee.

Clark: But I did appreciate his friendship and always felt bad. There are other stories in there that I don't care to go into. I'd had an experience with John Doerr. When I first came to Stanford, he had just left Intel and started work with Kleiner Perkins. And John, he's an aggressive, tough little sales guy, very smart guy. Actually, he's the one that kind of carved Martin Newell and I apart because Martin was willing to go off and do this work for this company in Chicago, and I had a bigger vision. So, I was a little resentful of John, but he was on the board of Sun. He's an aggressive guy and I knew him and I decided that he would be the investor I would like to have. So, in the series B, I went to John Doerr. He jumped on the opportunity and KP came. And he helped build the management team at SGI-- I mean at Netscape. And he also helped recruit Jim Barksdale. So, I give a lot of praise to John for helping build the management team at Netscape.

Hancock: <Inaudible 01:12:26>...?

Clark: And then I started Healtheon and I went back to Kleiner Perkins and got John on that board and so I got a good long-term with John.

Hancock: The-- you mentioned that the lessons you had learned sort of painfully in terms of how you structured your relationship with your investors from SGI, you would never repeat that again. Can you talk about the way that you structured your investment with Kleiner with you being the primary investor in series A, and talk about the business side? And then, of course, we want to-- Marc will pass the kind of beginning of Netscape.

Weber: Yeah, the beginning of the Netscape story.

Hancock: But while we're talking about John and the Kleiner...

Clark: Yeah. Well, John wasn't really part of that thinking. I just felt like Mayfield Fund hadn't done the right thing by me. And it may have just been something they….Either they didn't have the courage to do in support of me because, let's face it, when you hire a CEO, his job is to run the company. And nominally, I was an employee working for him in some respects, but I was also the chairman. So, it was always real--

and if he and I had worked like that, if Ed and I had worked like that, it would have been a different story. But Ed didn't work like that with anyone. Ed was party of one. He was in charge -- very quiet, intense guy and not my kind of person, really. We just didn't get along. So I was resentful and to some degree, even with Dick Kramlich, because he was on the board. But Dick and I remained friends. And I wouldn't let him invest, either. He wasn't really asking to. But Dick, when I finally was leaving and in the last year that I was at SGI, Dick and his partners offered me a general partnership at NEA for-- and Peter Barris and a lot of really talented people, and I just looked at it. And Dick gave me a long tutorial on what it means to be a venture capitalist. What the carried interest is and how it takes a long time to make any money, because your partnerships last 7 years, and you're just one of the 10 partners.

Weber: You're planting seeds.

Clark: And you might start making money, maybe $10 million a year after 7 years. And I just said, "I want to knock it out of the park. I want to do something big," and decided not to do that. But it was a big gamble for me because I didn't know anyone, didn't know anything to do. I had this fragmented idea about a network gaming company, and in fact, when I quit, that very day I sent an email to Mark Andreessen. And Mark was sick of anything to do with Mosaic because, frankly, I think Larry Smarr-- I don't really want to accuse him of it -- but I think Larry was part of claiming the credit for Mosaic and Mark resented it, rightfully.

So Mark didn't want anything to do with Mosaic. He didn't want anything to do with browsers, anything. I didn't want anything to do with SGI, so we said, "What are we going to do?" And we started talking to Nintendo and they were willing to fund a network game activity and that's what we were going to do. But as I looked at it closely, they were going to own more than half of it, and any corporation that owns more than half is going to make you do what they want to do.

Neither of us wanted to be an employee of Nintendo so we backed away from that and then Mark actually had the idea. He said, "Look, all my friends are leaving, getting jobs. They're graduating, all the guys that work with me on this," and I didn't-- I wasn't going to recruit any SGI people. So, we were going to target those guys, and he said, "We better do something, because they're going to all graduate. And I said, "Well, what do you think we ought to do?" He says, "I don't' know. Let's rewrite Mosaic and make it a-- see if we can make money on that." I said, "Okay." We flew out to...

Weber: Wait, let's-- can we back up a bit?

Clark: Mm-hmm.

Weber: The-- so it's Bill Foss that introduced you to Mark. Is that...?

Clark: Who?

Weber: Bill Foss.

Clark: Yeah, Bill Foss. Yeah.

Weber: Right. So, he suggested you write to Mark or vice versa. You were talking to Mark not necessarily thinking of even doing something networking related, I mean network games, but it was just...

Clark: No, I thought...

Weber: ...because you thought he was a bright guy and you were impressed with what he had done.

Clark: I called him because he was a smart guy, I presumed, who was in a nominal job -- having left, graduated, and he had a reputation of being really smart. So, I called him. I sent him an email and he responded 10 minutes later and we met the next morning with nothing, no objective other than I wanted to start a company. I told him that in the email. And I couldn't recruit people from SGI, so would he like to talk about starting a company together.

Hancock: What was the first conversation like?

Clark: It was like any kind of exploratory conversation between two geeks. I had something I didn't want to do, he had something he didn't want to do, talking about what we might be able to do. And we embarked on this three month period of meeting at my house and drinking a bottle of wine, having dinner, talking about what we wanted to do. Talking through potentially doing a gaming network company. And then none of that panned out, as I said, over a period of three months. Then, it was April. That was January.

Weber: And you were still-- according to Michael Lewis, you were still thinking of interactive TV in some form, right?

Clark: Well, you mean according to Mike's book?

Weber: Yeah.

Clark: It certainly had an influence. Remember, I had done an Nintendo deal at SGI. I had done the Time Warner deal.

Hancock: Time Warner deal.

Clark: They all kind of mixed together in the milieu. It was sort of, some kind of box doing some kind of networking thing and some kind of gaming thing, not very well defined.

Weber: But probably involving hardware, as well.

Clark: It would have involved hardware. And then, like I say, it all kind of went up in smoke. We went out and started meeting with the guys with the objective of hiring all of them and having a well-defined

program to go execute on. The well-defined program really was to rewrite Mosaic, and do it in such a way that you don't even look at your old code. There was nothing patentable or, at that time, patented about a web browser. So I just said, "Just to be safe"-- well, first I hired the guys. No, first, I established that Mark was the leader. I had never met them. And when I went out there with him, it became clear to me immediately that HE was a leader. It's an important thing because if he had just been one of the team and they didn't want to follow him, but they were willing to follow him. And so, I was kind of the elderly investor. At the end of our first meeting over beer and pizza -- Mark and I met the next day, and we just said, "Okay, how about this?" And we gave _____? stock and agreed to put-- I said, "I'll buy half the company," and that was it.

Weber: And you knew Larry Smarr and probably Joseph Hardin before that, right?

Clark: I had given Larry Smarr 30 workstations from SGI to do astrophysics research.

Weber: Right, because there was a room with NCSA with your name on it. I mean, were you-- you weren't involved with the cave, the VR stuff.

Clark: No.

Weber: But you had a-- but there was a room, the Clark Room or something there.

Clark: I have no idea. I don't recall that, but I gave them some workstations when I was at SGI and...

Hancock: So that initial investment came from your own money from SGI. Is that right? You were-- or whatever you...?

Clark: With my limited net worth of-- I had about, say, $15 million of liquid net worth. I had a house, too, but...

Hancock: And how much of that investment went into Netscape...

Clark: Ultimately...

Hancock: ...or Mosaic Communications, I guess it was called at the time?

Clark: It was called Netscape-- it was called Mosaic Communications.

Weber: Like Mosaic...

Hancock: Mosaic Communications Corporation first, right?

Clark: And I put in initially, I think it was 5 million, but-- and we exploded. We came back. The press just went crazy that I, (a), had left SGI, (b), had started this thing in the same day, effectively, <laughter> it

seemed like. So, I think a lot of people at Silicon Graphics just assumed that I had this idea when I was there, but I didn't. It was Mark and I, and it was nothing but software, right? We weren't going to build any hardware, and we were just going to rewrite that and develop… To be very, very frank, in the very early days, we didn't have any idea how we would make money. And then, we decided in the process of structuring the language on the license agreement, we decided to make it free for individual use, but if your company used it, you had to talk to us about a license.

Weber: So is it fair to say that it's one of the first instances of freemium?

Clark: I don't know. I don't know if it is or not. It didn't seem so-- there was a little element of misdirection, I guess you could say, because you say, "Hey, it's free," but the fine print said, "except if you're using it in your place of work. Then, your company has to take a license." And trust me, there have been a lot bigger mis-directions happen since that, and I could even name one, very prominent one, but we won't go there right now. It wasn't really misdirection. It was obvious. It was written in the licensing agreement, but it was in the fine print. People didn't read that when they downloaded it, including people who worked at companies. So, what happened is the companies discovered suddenly their-- all their employees were using this thing. They say, "We'd better take a license," and for literally for the first year, I don't know, our sales department was taking orders.

Weber: That's where-- right. You didn't have enough phone people or something.

Clark: And in that first year, we had $70 million in revenue off of a product that was nominally free. But there is one thing I'd like to make sure that the record understands is that we did kick off the dot-com bubble, but we weren't a bubble. We had $75 million in revenues, and were profitable that first year. The next year, it was $225 million in revenues. In the third year, it was $500 million in revenues. In the fourth year, $700 million. So we weren't one of these no revenue companies worth a billion dollars -- but what happened during that time is a lot of these companies, it was such a bubbly time that by the end of the '90s, you had a large number of people claiming to have a business, but they had no revenues or de minimis revenues. And...

Weber: When I've talked to-- do you remember John Kolar [ph?]?

Clark: Yeah.

Weber: Because I think it's him that told me that some companies might have been surprised, but a lot of big corporations wanted to pay because they didn't want to use a free product and find that it was pulled the next day. And actually, our current CTO at the museum comes from Cisco, and he talked about wanting to do that contract with Netscape early on because as big company, they wanted the full support. They wanted a guarantee to be there, so I think it was often in the interest of the company, right?

Clark: You're talking about a company's perspective not using a free product. A company wants a supported product. Even Linux, as it became popular, Red Hat built a business just supporting it. But yeah, from our perspective, it was important to have that clause in the licensing agreement, and it yielded

a huge amount of money. Now, of course all of this skates around the central theme of those years, which was that I wanted… The University of Illinois would not license us Mosaic, and we didn't want to use it. We just wanted to clear the air that we weren't violating any intellectual property. So, we offered to pay them [for] a paid-up license, and they wouldn't do it.

Weber: This is before they spun it off to Spyglass, then?

Clark: Spyglass was kind of in the middle of this for -- and this, Martin Newell, John Doerr were funding Spyglass. And I may be getting things confused here. It's been a while, but in any event, I think I'm confusing that with the company Martin went to work for who also had a license to some of the stuff we did at Stanford. Doesn't matter. The basic idea was that the University of Illinois, in the form of Spyglass, would not give us a paid-up license, and at the exact same time, they gave Microsoft a paid-up license. And I just felt, what an "up yours" from a university. First, they were angry I had hired all the guys, and I said, "You know what, universities aren't supposed to be in business. They're in the business of education. I gave your guys a job, and you're trying to disable it." And they did. They tried to essentially put us out of business by not giving us a paid licensed— I couldn't pay them. We had already planned to give it away. I wasn't going to give away $0.50 a copy.

Weber: To pay to give it away.

Hancock: To pay to-- yeah, pay to get the licensing.

Clark: And that's why I wanted a paid-up license, so I just finally said, "Look, we didn't take your intellectual property. We didn't use it," and I hired a guy to do a forensic analysis of the software to prove to myself and to a judge that we didn't copy it. And then I sued them.

Weber: So, you sued them? Because I...

Hancock: You...

Clark: I sued them, and I didn't serve-- I filed it but didn't serve it. It was filed in the state of California because I wanted that jurisdiction, but it sat there for 90 days. I kept expecting them to discover it somehow, but they were just oblivious to it. And my lawyer at the time, I think he felt that the right advice was just don't serve it. Don't serve the lawsuit because it's going to blow everything up and, meanwhile, I spent 90 of the most anguished days of my life trying to reconcile their badmouthing us to all of our potential customers. And I was the CEO at this time, and I was struggling with that. And so finally, I-- if you file a lawsuit and don't serve it, you got a time limit after which it's no longer filed, and I served it the day before...

Weber: Wow.

Clark: ...it was going to expire. And the next week, they had made peace because the university said, "We don't want to be interfering with our students," and it was… I apologize to you, Larry, if it's the wrong

person, but I think Larry Smarr was involved in not allowing it to-- allowing us to have a paid-up license, a bad mistake because I'm a good example of someone who is generous to a university. If they treat you right. Longer term, I ended up giving Stanford $150 million, and I think that is what-- the mistake the University of Illinois made is they-- had they treated their students with respect and said, "Yeah, you can go do that," given us a paid-up license. I mean why, when you give your students the intellectual property to go make money or at least a license to it -- Stanford did that to me in the form of the Geometry Engine. I got an exclusive license to the Geometry Engine. They not only wouldn't give us-- wanted to pay us $0.50 a copy, but they gave a paid-up license to Microsoft, which ended up enabling Microsoft to get off the dime more quickly. And so, they effectively created our biggest competitor and tried to kill the company. So anyway, when-- once I did sue them, the university, I don't think the university was knowledgeable about this stuff. It was Larry and the people that ran NCSA.

Weber: Joseph Hardin.

Clark: I haven't spoken to Larry Smarr since, but he's a terrifically smart guy and a great guy, but that was a flaw if he was involved, if he was responsible for that.

Weber: At the time, we interviewed people both-- bunch of Netscape people in California and then all the people that were still at NCSA. None of them could talk about the settlement back then because they were under some sort of gag order, but now you can tell us-- can you tell us what was the settlement, or do you remember?

Clark: I do remember, and I'm not going to tell you because I don't remember what the legal terms were. And-- but it was-- yeah.

Weber: But you did have to give the Mosaic name back. I mean, that's why it changed to Netscape, but then...

Clark: Yeah, that's another example of picayunish behavior on their part. I mean, I didn't care. I think Netscape is a better name, anyway, but why not let the glory come to the university? They tried to make the university licensing, I mean, a very unfair licensing vehicle.

Weber: I will say, SGI, though, Stanford, you had a very good experience with that. Stanford was not as easy for certainly Google or Cisco or I mean...

Clark: No, I think Google-- I think Stanford made out in the way they did Google.

Weber: They did, yeah, but they made it hard at the beginning before...

Clark: I don't know.

Weber: I'm just saying that you had a particularly-- as spinoffs go, SGI was really smooth for that.

Clark: Well, but in reality, we didn't even use the Geometry Engine, so it didn't hurt them at all. And look, John went on the board of Google, John Hennessey.

Weber: Right, yeah. No, in the end, it all worked out, but there was tension at the beginning where they-- there was a bunch of IP tension about it.

Clark: There were no patents.

Weber: Now, I did know a lot about this one.

Clark: Maybe there were, but you know what, it all worked out. I don't think-- if it was tension, I'll bet-- no, let me not comment about it.

Weber: And you bring up Microsoft, obviously. The business model which, at least the way I see it, is Netscape made the web possible, made web commerce possible, in many ways because you found a way to make money off an open standard running over a network.

Clark: Well, yeah. You're getting at something very dear to me now. My latest company is doing something that stems from the security protocol we established then.

Weber: SSL.

Clark: What I knew with absolute certainty was that we could not be successful without making. First of all, there was no security protocol, no security system on the internet in those days, and I was intent on bringing commerce to the internet.

Weber: But Mark had been working on-- wasn't he working on the S-HTTP for Marty, for EIT?

Clark: Could have been, but S-HTTP is a different thing than...

Weber: SSL.

Clark: ...SSL. What we wanted was from…. What we did is set up something that allowed you to guarantee you were talking to…. Here's the crux of what SSL does. It establishes a secure link between two parties, and it authenticates each party. So you know who you're talking to on both ends, and you're talking securely, so that no one else can overhear you. That didn't exist then, although what did exist that I was familiar with was RSA because I had been, as you know, principal investigator for DARPA. I had gone back and forth to MIT, met Ron Rivest. I met all these people. I knew them from my interactions as part of the DARPA community. And that stuff had been invented since 1978. So, there was no secret there. It was patented and RSA technology, RSA security had taken that technology and started a company called RSA Security.

Clark: And Jim Bidzos was running it. He's running the derivative of it now, the successor of it now. But Jim Bidzos I met. Worked up a license with RSA to use the technology and the process for creating SSL. I told the guys, "We got to create something for this." One of the few guys that came over and joined me from SGI was Kip Hickman. And Kip had been, and I still say he's one of the smartest guys I've ever known, he got us in the Unix workstation business back when we were trying to compete with the likes of Bill Joy and people like that. Kip got SGI into the System V Unix business, ported it to the 68000, did all of that. But Kip also joined Netscape from Silicon Graphics, and I gave him the task of creating SSL or creating what became known as SSL.

Kip is a very detailed systems software guy and he created the very first version of SSL, using RSA technology and invented a lot of the protocol. But it wasn't as robust as it needed to be. He wasn't a security guy. He had never studied under the traditional security folks, and he just picked up the stuff. And later I was giving a talk somewhere and Taher Elgamal was in the audience and I was talking about this. Taher and I got together, and I ended up hiring him. And Taher got Paul Kocher involved, another Marty Hellman student. So these guys worked up the protocol, what became known as SSL 1.3.

Weber: Because the first one was the one that was cracked on the--?

Clark: There were problems with it and I can't tell you the details of why.

Weber: Right.

Clark: But it was shown to have some flaws, so.

Weber: But that was 1.0 and then 1.3 was--

Clark: 1.0 didn't even ever get released.

Weber: Right.

Clark: 1.1 did or 1.2. And then version 3, 1-point, whatever you want to call it.

Weber: That's when you hired those guys and they really buttressed it, yeah.

Clark: They created the protocol for the last version that became what largely we know today as TLS. Also just the politics of the situation getting Microsoft to buy into it and all of that, we renamed it TLS, Transport Layer Security. There are a number of stories as to why, but in my opinion it was because SSL was created by Netscape and Microsoft wanted a new name.

Hancock: <laughs>

Clark: But that's my story and I'm sticking to it. But in any event, it was renamed as TLS 1.0. And then there was a 1.1 and 1.2 which became for use for years and then recently there's a 1.3 which adds some

other unique aspects. But the irony of all of that is that we had a system. It's just that and I don't think this is a good place to get into the details of TLS, but basically TLS is widely used to secure websites, to authenticate websites and secure the channel, but TLS was built with the ability to be asymmetric, okay, so that the user wasn't authenticated but the website was.

Weber: So the user could be anonymous.

Clark: The user is anonymous if you don't enable mutual TLS. So, if you enable mutual TLS, the user has to have a certificate. The website has to have a certificate but it also has to be a certificate that comes from one of a group of accepted CAs, Certificate Authorities, so there's this forum called the CAB Forum, Certificate Authority/Broswer forum. And they determine who gets to be a CA that can be the root. So they can issue certs to websites and/or organizations and the like.

Taher and Paul recently got the Marconi Award. I was part of giving that to them. And Taher, you know, we were talking about passwords and he said, "Yeah, we just looked at that -- no one wants to be a CA for users." And there's 5, 7 billion potential users out there, and in fact maybe more because you might need a certificate per site you go to. So it's not a trivial task. And so, he said, "We punted and just said let people use user-name and password." And that's literally the genesis of why we didn't force certificates on people. But part of the reason we didn't is the idea of getting a certificate authority to--

Weber: Yeah, you would have had to set up, or cause to be set up, a huge infrastructure.

Clark: Yeah, yeah. Well, in any event, my current company is called ZeroPW.

Weber: And we'll get to the--

Clark: Yeah. But it directly stems from that decision.

Weber: Right. And the importance at the time, though, is you couldn't do business of any kind over the web because there--

Clark: Well, yeah. You know, everyone in those days was worried about sending a credit card number over the internet. But frankly, it goes way beyond that. You know, yeah, a credit card number. You wanted a secret, you wanted a secure channel.

Hancock: A secure channel this was important.

Clark: You don't use a party line on your phone and you want to be able to have confidential conversations on the phone. You want to be able to have… A business absolutely requires a confidential conversation.

Weber: Yeah.

Clark: It's not just credit card numbers. It's every any secret you're talking about.

Weber: So, you saw that as building basic infrastructure for it.

Clark: Without it, I was absolutely certain we wouldn't survive. We had to build commerce on the Internet. And the irony is that in those days of course the Internet was free in everyone's mind and everyone thought we were going to ruin it. I was flamed beyond belief or called a lot of names and I would just say, "Look, without this you're not going to be able to rely on the government to provide this free to the whole world. The government has to get out of the business of supporting the network. You're going to have to have businesses supporting it because that's the way the world works. And businesses are going to need to have secure exchange, so it's going to get better, so trust me." <laughs> That's what I would tell people, "It'll get better. A lot better than the way it is now." It was slow because the government ran the backbone, and it used telephone modems. But look, just having a place for business to be conducted changed the world for the better.

Weber: Definitely. At that point did you also-- You talked later about a platform, the web as a platform kind of against let's say the Microsoft and Windows as a platform. Were you already thinking in those terms early on?

Clark: In an abstract way I think. If you step back, Microsoft pretty much controlled the world. You had to write to their APIs if you wanted to have any kind of commercial thing. And one of the things that the browser did was give you at least abstractly a single program through which you could go to many different websites, right. So even though at that time there were no APIs for writing stuff on top of the browser, we promoted it as a new platform because we had to have a story and part of that was marketing, but it was a necessary thing. We probably threw a little too much sand in the eyes of Microsoft.

<laughter>

Weber: Oh, yeah.

Clark: Both Mark and I when we would give talks would make jokes that Microsoft was the butt of, and I'm sure they didn't go down well with Bill Gates, because he made it a point of trying to kill us. But it would have happened whether we had made jokes about him or not. We were threatening to him.

Weber: But early on you had reached out to them to potentially cooperate, right?

Clark: Well, I don't know what you mean by that.

Weber: It's either… I think it's "The New New Thing," but one of the books that--

Clark: Right. Well, no.

Weber: Or maybe the--

Clark: We would have enjoyed if they had licensed our browser.

Weber: Right.

Clark: But they weren't interested in doing that. They were interested in taking over the browser. The irony in all of that is they took their eye off the ball and Google came along and showed them where a bigger business-- a business as big as they would ever be. And no one was thinking of advertising in those days. It was all just where is this going? Let's get a big piece of it.

Weber: Yeah and back to your business model. So, I mean, obviously the corporate license freed the user and you did think of a portal model later on. But how were you--

Clark: We--

Weber: How were you planning to make money off Netscape specifically?

Clark: As we did.

Weber: But that--

Clark: Charging--

Hancock: Corporate.

Clark: But longer term, Microsoft was going to make that free, we knew. So, you make money while you can and while the business model works, and we created servers and have created number of different other products. But it was going to be tough always. Microsoft was going to invade. Microsoft had tremendous throw weight and any startup, it's like trying to compete with Google. If you go directly at Google today you're not going to win. Go directly at Microsoft, you're not going to win. This was obliquely instead of directly, but Microsoft decided they wanted it. As you know, Microsoft also decided they wanted the search business but they didn't because Google had established the beachhead and yeah, so. Business is business, you know. I like to say it's a legalized form of warfare.

Hancock: <laughs>

Weber: And can you talk a little bit about Jim Barksdale who you brought in.

Clark: During the time that I was fighting this battle with University of Illinois, hiring a salesforce, building out the team, I wanted desperately to not be in the position I was in. And it goes very deep beyond I don't think I'm cut out for it. Companies, well, let's just say I wanted Barksdale really badly. So, we began to recruit. We met him while he was still COO of McCaw Cellular, and they were getting acquired by AT&T. That was all kind of going forward and he would talk to us but he says, "I'm not going to join you until we consummate this deal and it's done." But he said, "Yeah, I'm interested." So I made him an offer and the

deal got done right at the end of the year of '94, I guess. Yeah, end of the year. And he joined us first of January after I had sued the University, settled on that, gave them their little nominal amount and we shipped the product the first day he came to work.

Weber: At December or something.

Clark: No, he came to work in January.

Weber: Oh, is it-- I thought you shipped-- Oh, you announced in '94.

Clark: Yeah. We shipped the first shipment was January 1, 1995 and we went public in August.

Weber: And that was something he was not particularly keen on going public that early. Right?

Clark: Yeah. This was me. First of all, it was Frank Quattrone, and I got Larry Sonsini involved, and I had Frank come in and give a pitch and it was in June. And Frank was very positive about the prospect. We were-- Huge amount of publicity. We were making a lot of money. And I don't remember the role Larry played but he was supportive. I mean, he's a legal advisor and a great one. And so, Frank had the board make this presentation and Barksdale was a little skeptical, and then he said he wanted to think about it. And then over a period of time he decided, yeah, we'll do it. I was keen because look, I had spent all those years. I could see that I could make some money here, and I was keen to have the liquidity because I was pretty broke. I had spent all this money, all of my liquidity on SGI, really. I mean, on, sorry.

Weber: Netscape.

Clark: Netscape. And I never got a salary ever out of Netscape. And once Barksdale agreed to do it we started the machinery and we went public in August even though people said you can't go public in August because everyone's on vacation. And it was a hugely successful IPO.

Weber: And the Spyglass had gone public. Was that-- That must have been part of your thinking as well, right, or not?

Clark: I'm not even aware. I hardly remember the name Spyglass. They were not in my thinking.

Weber: Okay.

Clark: Not that I recall. A much bigger part of my thinking was my own wealth.

<laughter>

Hancock: Talk about that roadshow, you know, to the IPO and then that day, I mean, just in terms of pricing and the, you know, what happened.

Clark: You know what? I didn't go on the roadshow.

Hancock: You weren't involved in that?

Clark: Not that I remember.

Hancock: Okay. How about--?

Clark: Let's face it. Jim Barksdale was the CEO.

Hancock: Yeah.

Clark: And there's method behind my madness. I had spent 12 years as an officer of a public company having my hands tied behind my back forever. And I didn't really want to be a big part of this once it was public. I stayed with the company and I traveled a lot and went around the world promoting the company. I was kind of the roving ambassador. And I bought a plane at my own expense. Never charged the company for any of that. I flew it around the world multiple times taking marketing people. We went to Korea. We went to Seoul, South Korea. We went-- All these different places-- Hong Kong Japan, Europe,— on my plane and I never billed the company. One, because I was just trying to make the company worth more. And that was my role. And Mark and Barksdale began to run the company. They dealt with Microsoft; I didn't. There was some kind of a deal being proposed with Microsoft that I don't think ever got done but.

Weber: That they proposed to-- What do you remember?

Clark: I don't know. There was a deal going on between-- Look, I don't-- I didn't care. I despised Microsoft. I didn't want anything to do with those meetings. I'm sure I would have not been the most gracious host and--

Hancock: <laughs> Funny thing. <laughs>

Clark: I just wasn't involved in any of the meetings on purpose. And then when we got acquired I had no interest in being on the board of the acquiring company, being any executive in any kind of role because I that meant golden handcuffs, you know. And it's one of the few, one of the wisest choices I ever made was once we were acquired I backed away and in 1999 I began to sell my stock. And I got it all sold by 2000 before the dot-com bubble burst <laughs>

Weber: Oh, wow.

<laughter>

Hancock: Perfect. Perfect timing.

Clark: And so I made a lot of money that-- I made-- I got out before the crash and then--

Weber: Wow. That made a big difference.

Clark: Because I wasn't affiliated anymore.

Weber: And the IPO itself, do you remember that day?

Clark: I remember I had 20 percent of the company and I could calculate here what the company's value was but I know my net worth on the IPO day was $663 million dollars. <laughs> So multiply that times 5 and that's what the-- So $3 billion probably was what the company was worth.

Hancock: That's a great day.

Weber: And it was a--

Clark: Huh?

Hancock: A great day.

Clark: Yeah.

Weber: It was a unique decision or tell me how unique it was to give-- You gave quite a significant share to Mark and then also to a lot of the engineers that came, certainly from NCSA but also SGI, right?

Clark: Yeah. I think depending on whether Mark was able to sell at the right time, he should have made, you know, $150-$200 million dollars, I would think. I was able to hold mine. I didn't, you know, I gave some to my kids on the IPO and they sold theirs. My mom held hers. It went down from whatever, say $3.5 billion to being worth about $1 billion, when AOL bought the company. And then a year later it was worth $10 billion. If you had held on to your stock you made 10X in one year. I know, because I held on to mine. But then I began to sell. I began to sell because I thought the market was crazy, the dot.com bubble.

Weber: You weren't wrong.

Clark: I wasn't wrong-- I was right.

Hancock: Well, it was a different kind of an IPO, because before then the kind of mentality had been you need to have consecutive quarters of revenue, and this was different kind of rules that changed the rules of the game for going public, if I'm not mistaken.

Clark: Yeah. We didn't have a full year of revenues and that was-- that was the part that was unusual. But we were a bona fide company. We had, and like I say, after four years we got to almost a billion in

revenues before we-- Microsoft really hit us hard. And then we were going down in value pretty quickly and Steve Case felt, and he was right, he was able to buy us and it shot his stock up.

Weber: But that decision, though, to do an IPO in such a unique way, I mean, you were as you say thinking more of your own wealth. But I mean were you thinking of sort of breaking the whole model, changing the model of how IPOs happen?

Clark: I was just thinking that being public gives you a certain image. If we had stayed private I don't think we would have grown quite as well. Because of the marketing, it's a marketing exercise too. You become better known. You're publicly traded. The employees have now, you know, it's a relieving thing.

I mean, I've got an investment in a company called Palantir right now which is, I try to tell Alex Karp who's the CEO, I said, "Look, it's just not fair to your employees to stay private so long. How do they get liquidity?" I mean, there are some pretty severe things happen when you offer stock options to someone, okay, they don't exercise them because they can't afford to buy them if you've already got value, right. So they sit on them. Time goes by, four years they're all fully vested and they're tired of working there and they want to go work somewhere else. They can't afford [to exercise their options]-- if they're underwater, they don't, even though they're fully vested, they just walk away from them. And those kinds of companies are doing a serious disservice to their employees. And it's one of the things, I have such a hard time understanding. Peter Thiel's supposedly this great businessman, but that's a terrible business decision, to keep that company private all these years, 14, 15, 16, 17 years? This is not serving myself at all here because I've got a substantial amount of money in that company, but…. There's a certain coming of age, if you will, bar mitzvah. I don't know, you call it what you want. There's a time for growing up and part of growing up. You can remain private. You know, there's countless companies-- Warren Buffet buys a lot of those companies-- there are countless companies, well-managed, that do stay private. But you don't do it by giving all of your employees stock and telling them you're going to get rich on stock, then not go public. It's just not fair.

So, we had a program like that, and I felt like it was a good coming of age story, a marketing story. Tell the world our story and become better known. Compete with the big guys. You know, you're grown up and you're out and competing with the big guys. If we hadn't done that I don't think anyone would ever-- Chances are AOL might never have bought the company. We might never have made it again. <inaudible 02:04:08>

Weber: It certainly drew attention to web commerce in a way that nothing else could have.

Clark: It kind of blew the lid off, really. Then suddenly everyone and his dog was some kind of web-based company.

Hancock: Literally, <laughs> right?

Weber: But nobody knows on the Internet.

Hancock: That's right.

Weber: No.

<laughter>

Hancock: In terms of the through lines of how you think about these other companies that you've invested in and started, maybe the details of Healtheon and those others may not be as interesting to you, but from hearing you talk about they have been--

Clark: It's sort of--

Hancock: Just stepping stones in your journey of how you build companies and how you create values and wealth and the role that you play as a financier and a, you know, technology vision person.

Clark: You know, I'm on the board of my daughter's school, a private school, and we recently recruited a new head of school and one of the people who we were recruiting was talking about discipline and how she's, all girls, you know, high school age girls and she mentioned expelling this girl and it made me reflect on my own experience of being expelled. And I know, at least my perception of my state of mind then, was I didn't feel like anyone cared and no one really was making any effort to understand me. I was very confused in my own life. And I recommended to her, I said, "Try to take some time because sometimes, it's just a child who's confused and they're looking for some kind of a mentor or someone to give them good advice instead of a disciplinarian."

But it makes me think about a good deal of the drive that I had came from wanting to prove myself, I guess. You know, starting to feel a sense of accomplishment even in a school that wasn't hard. I was in a class A electronics school in the Navy and I was with a bunch of other high school dropouts. But little pieces of accomplishment, right, they give you more, in my experience, give you more drive, more motivation — every little fragment. And so, I used to really strive to get those fragments. I wanted to get an A in this class, and that would encourage me to try to get an A in every other class. And you don't always make it, but you try; at least not until I got in grad school did I start making it.

So jump to Silicon Graphics. I started a company. No one would argue with the fact that I provided the graphics direction, the drive, the inspiration, the leadership to get the people. And over the years it burned me out, and I got so upset that I was perceived as a troublemaker in the company. And as I say, I'll take that accusation. But there was still that inspiration and drive going on in my head to get this thing to be successful for the long term. I didn't want something to go bankrupt. But when I left, I felt like you know what, most people just view me like everyone says about an entrepreneur, he was just lucky. And there was a tremendous amount of that. There is a lot of luck. So, when Netscape blew the lid off and you know, I started to get rich, I was lucky twice.

I wanted to have another success. So, I was thinking about the health problems that I have. I have some genetic problems. They don't show up except in my blood. When I first got that genetic testing done, I

said, "You know, that--" And my desire to start Healtheon was to try to remedy that. You do it even today. You go in and you fill out the same piece of paper at every single doctor's office you go to. So, I was so frustrated with that and I thought I was going to fix that. But UnitedHealthcare and a bunch of these big monopolies-- or not monopolies, installed base of insurance companies, you know, they're not going to let you do that kind of stuff if they can keep you from it. And the CEO essentially told me that. He said, "We're going to do that. I'm not going to buy it from you."

Hancock: <laughs>

Clark: So there's a tremendous amount of that-- there was in that. I just wanted to prove another success, to prove that I wasn't lucky. So, it was a good deal of ego. You know, I don't have a big successful company that still exists. And I still have a desire to create something that has long-term sustaining value. Silicon Graphics was doing well and then after I left they just missed it and it went down. Netscape got the hell beat out of it by Microsoft. We got bought and, I got out, but the company didn't really survive. And Healtheon merged with WebMD and it survived but it's not any great shakes, It's' just a website. It does still survive. It still exists. Shutterfly still exists. They're not, like, great and grand companies, but I got a little bit of imprint on all of those.

As I talk about it, drive is my keyword. You've got to have a massive amount of drive. Either that or you're completely lucky, okay. I don't know, look at Snap, or Snapchat, you know, that. What's his name? I forget. The CEO of that. He's got a lot of drive. You can look at it and say it's a trivial little thing, but he does. He managed to survive and is still managing to survive in the face of Facebook. And you know, it takes massive drive to be successful in a company. The world is a competitive place. Someone good at trying to do-- If you show success, someone's going to try to take it away from you. That's just natural. They're going to try to compete with you and do a better job or whatever, so it always takes a massive amount of drive. And that's the one thing I have, and I think I got it from the failure in high school. And to be expelled from Podunk, you know, nowhere, by far the most successful person to ever come out of that little one-horse town. Not saying a lot. But Jimmy Dean, he also came from Plainview, Texas, so there's a name people know. But that drive has to be there. You're not going to get something. You know, there's all kinds of things that will happen that will discourage you and make you lose faith and want to stop and quit and-- And you can ask my partner, Tom Jermoluk, I've got drive. He's the best manager of people I've ever known, and so we make a great partnership, because I have that entrepreneurial drive and he's my partner, so he gets to benefit from that. But then once it turns into something where he's in power, I get the benefit of his drive or his skill.

Weber: What does that drive feel like to you?

Clark: It feels like fear, anxiety. A lot of it as it initially begins, that's the competitive, when you get to the competitive stage, fear someone else is going to beat you out of that idea or anxiety that someone's also doing this in maybe a better way. But the drive is something that's just compelling you. It has elements of fear and anxiety and vision and desire to see something different in the world.

There's not an entrepreneur out there who's not trying to say this is the way things could be and it's stupid that they're the way they are. So that's a lot of being an entrepreneur, I believe. It is for me, anyway. And everyone's got their own story. Who knows, ask Elon Musk. I mean, the guy, he's one of the most brilliant marketeers to hit the face of the planet. But, yeah, that's-- I mean, that's his singular strength. But it's, who knows what drives him? But you know, what drove Bill Gates? Or Zuckerberg?

Hancock: Yeah.

Clark: All of the people. I sort of know Larry-- I know Larry Page and Sergey. But they're driven by-- He was driven by making search more pertinent and it was more of a technology drive. A lot of my SGI stuff was a-- I wanted to see graphics easier to use than Evans & Sutherland had ever made it, cheaper. I wanted it to be every man able to do it. I was successful. It's just that I'm not the owner of NVIDIA

<laughter>

Clark: But, yeah, so it's a complex mixture of things that include fear, anxiety, desire to see the world change.

Weber: But excitement, too, right? I mean, some creative excitement.

Clark: Well, excitement is a side effect. But I don't think it's, at least for me it wasn't-- Yeah, it was a side effect of success.

Hancock: So many people who have had opportunities and have felt a drive, when they faced a really hard challenge or a dark time it's been something that has sidetracked them. Can you think of a time that you would share that was a dark moment, and what was it and how did you persist so that that drive could come out on the other end?

Clark: Oh, I've got a doozy but it's just personal life, you know. Your personal life can collapse around you and your drive and your intensity can drive people away, loved ones. I fell into a bottomless pit for about two years when I was at Stanford. Actually, because of a personal thing. What got me out of that, I could have continued to wallow around in the darkness and probably had mental problems if I had. But I I read books and I discovered that, you know, I was the one that got myself in there and only I was going to get myself out. That was the realization.

And what makes I think people happy is productivity. You know, feeling like you're accomplishing something. You don't have to be making massive wealth. Feeling like when you go to work you did something and you feel reward from that. I think that's what drives most people to be happy. That's what makes most people happy, being productive. You can ruin that yourself by digging a hole and crawling into it. I don't know that there is one formula, but that combination of having nothing as a child, having to put myself through all of those years of school.

Change has always been good. I switched from electrical engineering to physics to computer science to business. I initially thought I wanted to be an academic. All of these changes open up new vistas. You know, you're equipped with all of the things you bring from your other professional pursuits and academic pursuits and they all make you who you are as you go into something new. And that's why I like variety, I like multiplicity. It's like art gives me inspiration not because I want to be an artist. I just admire people who can execute on a vision. It's a pity in a way. These days entrepreneurs are worshipped to some degree, but if you look at the vast majority of the earth, we've worshipping musicians, it's the creative people, it's the entertainers. And the movie stars and all. They get so much more recognition than the Joe Blow who goes in and has a lot of good ideas to help make a company. We get money if we're successful. They do too, the artists do. But watch TV, you don't ever hear-- Or, okay, there's' the occasional sitcom where what's the one? I don't watch TV, so I can't really name it. It's about physicists. What's the one where the--? In any event, it doesn't matter. But people are who are entertainers tend to be worshipped in our society and the artists and the entertainers and so on.

But there's those quiet little shy guys that are off working on some new idea that are actually changing the world, like bringing out the commercial Internet, which is what Mark and that team of guys and I helped do. And we've had a huge impact on the world. It hasn't resulted in enormous wealth in a surviving company, but we did. And Bill Gates gets worshipped, a lot of worship. And everyone wants to know what he reads and he's pals with Warren Buffet and so on. God bless him. Good on him, you know. He's a smart guy. He deserves everything he got. Not all of it was gotten with good behavior. <laughs> But he deserves it because he won. You know, not everything is just. Business is warfare, it really is. You even, say you're trying to kill the competition. You are. You really want to put them out of business. Larry, ask Larry Ellison what that's like. <laughs> He knows. He dominated databases because he was that kind of personality. I wasn't quite as ruthless, but I've had a lot of fun.

Hancock: <laughs> When you look at the Valley kind of and the broad sweep, you came at a time that was so early in the Valley as a place for both innovational entrepreneurship. How would you characterize it and its role in the world, kind of its impact and particularly the kind of inflection points that you were a part of because you have been a part of that for so long?

Clark: The big two inflection points for me were turning graphics into something that's everyday. I mean part of that. Ivan, all kinds of people were my mentors, but yeah, I was part of it. And then being able to see that the Internet could be much bigger. It's almost like it was going to happen. Mark did Mosaic before I ever came along. But the combination of us got together and made it business. Made commerce work. It made the Internet work and laid the first few bricks in the road for the Googles and the Amazons and so on.

So the inflection points that I feel most I don't want to use the word proud but I feel really good about, and I think if you talk to John Hennessey he would corroborate this to some degree, but when I had made a lot of money and I kind of wanted to go to Stanford and become a biologist. I was kind of over computer science. I made a lot of money. And I thought I want to do something in biology. And he took me around. He was the Provost. And he took me around — or maybe he was Dean of Engineering at that time — but I think he was the Provost, and he took me around to meet all these biologists and see what they were

doing. And I was just overwhelmed and I thought, "Whoa. I'm never going to be able to get caught up enough to do anything new in this field."

So, I went away after that and I was thinking, "I don't know if I have the right stuff -- <laughs> You know, that's a lot of work." I was already 50. And I just thought this is not going to work for me. So, no, this is probably before I was 50, because I'm 75 now. But I said, I went in to talk to him one day and I said, "Look, I think-- I was thinking maybe to start my own research place, research lab. But I'm going to have to compete with Stanford for all of the talent and everything," I said," And I think I'm better off giving you a bunch of money." And so, we started thinking about that. And they were, unbeknownst to me, already doing some work on the BioX activity, so I provided the funding for that. And I think that'll be one of the most significant things that I've done outside of Netscape. Netscape was significant in the way it affected the world, but this is going to have an impact too. And that was out of just gift, generosity.

So I'm glad I did that and I'm glad I had a part in that. Even though I could never have been admitted to Stanford, I couldn't afford to go there, I'm glad I had a chance to be there, which is another reason I gave them the money because somehow for a combination of people enabled me to be successful once I stepped in the boundaries of Stanford and so I thought, well, I'm going to donate something back. And John will tell you. I mean, he was Provost when I did that. He got promoted to President. It was the biggest gift to Stanford outside of the founding grant in those days and then John and his talent managed to convince all these other people in the Valley to give also. He raised more money than anyone's ever raised for Stanford. It's in the many billions. So, I think I played a little role in getting that started and I'm glad for that.

That is a big transition in the Valley. The way the Valley is today has become so expensive to live, to be dominated by a couple or three companies. There's still a lot of smaller companies but those two or three behemoths, I guess it's good. You need-- there's got to be enough room for little guys to not get stepped on and to grow. Dramatic innovation I'm pretty convinced is not going to come from the Googles, not going to come from the Apples. Apple is a great company. I love their products. I use them. And they're quite innovative. But I'm talking about the revolutionary changes. Those will be created by some people who get together and decide they're going to make a difference.

They may have worked at one point for Google and learned some things there. But you need that thriving startup atmosphere. I think it exists now in New York, to some degree, certainly as much as out there. And the irony is that, here, in New York you can hire people and that they're not always worried about how much they're going to own in the company. In New York you won't find anyone starting in a company saying "show me the stock". And I'm the kind of person I'm going to give stock whether you ask for it or not because I believe people deserve to own part of the company. But I'm not having to fight that battle in recruiting out here. So, it's a different recruiting environment. There are just as many smart people, a little less of the type.

One way I like to think of it is you have the infrastructure for financing, but most important is the infrastructure of management, a culture that allows people to move and they've cut their teeth on some company. And I don't like employees that are jump, jump, jump always get the better job, but those

who've spent some measurable time, significant time helping make a company successful. Those are the kind of people you want to manage your startup. That is not so true out here. So the management structures you have to bring them in from Boston, DC. And the people here are mostly finance. Right? But people will move. New York is not a bad place to live. In California it's just as expensive [as] here now. And I think it's got all the problems you've got here in equity of housing and all that. But I think this is, to some degree, more vital. I like it better than California, I think, for starting a company.

Hancock: You've also been an investor in so many companies. You mentioned a few of them, Shutterfly and others. When you were evaluating the team or the idea that you're investing in, what do you look for?

Clark: Oh, boy, that's a tough one. The fact is you invest in teams of people instead of ideas. Ideas form the basis of pulling that first team together, but I don't know many people who invest in the idea. And the mistakes I've made is to think the idea was central. The much more central importance is the team and that's where you have as high as likelihood of failure. I don't want to mention the company but there's a company now that one of the other investors-- there are three kind of equal investors, three equal board seats. Right? And the management of the company has three board seats so there's six. And one of the investors thinks that they should have some kind of special say. And you just want to tell them, look, the guy's quite young and I sometimes just want to say, look, I didn't start this game yesterday. I know what I'm doing. And, likewise, my friend TJ is on the board and it's just amazing how bad some investors are, truly bad. So that's one way you can go wrong, get a bad investor.

But in this particular case, the bad investor tried to carve the CFO away to have a visit without telling the CEO. That's how bad he is. So, there was a little discord on the management team, too. Companies are really a delicate thing because of the people, if nothing else. You've got to get a group of people who are working hard together, common objectives, no talking behind people's back. Everything is out in the open as the management team. And then you have a hope of getting a company going. But all of my mistakes have been not doing enough due diligence on the people. Or thinking too highly of myself. Or the wrong market but that's usually the function of management. If the management are smart they're going to be in a good market and have thought that out. I won't claim to be very successful in any of those. I've made five successful investments not counting Silicon Graphics and Netscape. Well, Netscape was an actual investment.

But I think I've been wrong -- MyCFO was a great example. That was a company that I founded once I was wealthy needed someone to help take care of my bills and investments. I needed a family office, but I didn't know it at the time. So, I got my friend Harvey Armstrong, who was my accountant and he said, "You know. I could do this for 10 different families." And I said well, why don't we start a business that does that? Unfortunately, the CEO we got wanted the company to offer "tax products". Tax products here are put in quotes because they were created by accounting firms but they had to do with avoiding taxes. And I remember calling a meeting and I said, guys, I don't think we ought to be doing this because if it ever gets disallowed by the IRS, our business will just go away. And I won't buy one of these tax products because I think it's dodging taxes; even though it's the letter of the law, it's not the spirit of the law. Let's make sure we're doing stuff that hits the spirit of the law, as well. The CEO wanted to do it. The board went along with it. We started doing them.

Two years later Anderson Consulting happened, and the whole thing just blew up in our face and we couldn't offer these tax products anymore. Half our revenue was coming from them. You know what happens when you lose half your revenue? You lose your company. So that's an example of it's just bad, I won't call it governance because I've got respect for all the people. I don't want to mention who the board was. But it was not a good thing to do and it was because you could just-- it didn't feel right to do it. It was technically legal, but it became ill advised a couple of years later. And you could've guessed that would happen. I did. So, there's a lot of ways you can fail. That's why most companies fail.

So, I'm lucky to have had maybe half my companies I've been involved with have at least been successful and to have been big. But I don't go into them lightly. It's hard to make a big success. It's really hard. That's why take my hat off to all these people that have done it and sustained it. Look at Google. Google is a funny one. They started out giving away search for free. It wasn't a sustainable business model. There was no business model until someone said, "Well, suppose we sell the top two positions. And the people bid for the top two positions as an ad." It's no longer doing what they were doing. But they're making money. It's just that they're no longer offering the best searches. I always look past those top two and click on the third one so I'm not delivering click bait.

Still, what other company has revolutionized your ability to get access to quality information like Google? I know they are the best search engine. And I know that those top two-- and I know to work around the ads myself. But I still use them. I don't use Gmail. I don't use a lot of these other little bait to get you hooked into Google, but I do search and I would pay for it. I'd rather pay for it then have ads stuck in my face.

Hancock: In terms of you as a serial entrepreneur, bring us up-to-date with CommandScape and what you're working out today. What are the ideas behind those? And what was the germination for those companies?

Clark: There's nothing very significant about CommandScape other than I had a big house and I wanted to be able to control it, the lighting, the security, all aspects of my home, access into the home. And so as a hobby I just worked on this stuff. This is during my retirement years starting when I was about 60. I just kind of retired and worked on boat control software and home control software. It never was destined to be super big. What I did want to do, though, which is going to be a big deal -- at Netscape we created SSL, TLS, whatever you want to call it. It's what secures your connection to the website. It's what gives you proof that you're talking to the website. It all happens automatically for you.

But back in '95 when we did this even though we could give the user a certificate that guaranteed-- allowed him to prove who he was it was just too much of a hassle. And we were trying to get too much done. So, we just said we're going to make it optional whether the user uses a public key certificate and let them use username and password and never thought about again for years until passwords just started haunting all of us. So this little CommandScape company, the first thing I did was say we're going to use SSL to make sure that don't have to enter a password. And we did that. And then it still required all of the old infrastructure certificate authority, we created all of that and made it available. And it's still offered as part of what the company does.

But then the two guys who worked most heavily on that wanted to go do it as a broader thing for everyone to have a way of eliminating passwords. So, we did that. And they invented some very clever things that make public key certificates usable by ordinary people. We applied for patents on that. And now I'm recruiting heavily here in New York to staff that company and sell that to the broad market. And we have one big customer that has 150,000 employees. It's a big partner. I don't want to say it here. But it's a good company. And that's kind of our first customer and we're going to sell it to millions.

Weber: Can you talk about how you solved having ordinary people use certificates? Or is that part of the secret?

Clark: Suffice it to say that ordinary person can now make their own certificate. They can prove that they're the owner of it and they come present it to a site and prove that they own it. And it's based on TLS.

Weber: So, they've become their own authority, in a sense?

Clark: I don't want to go into it here, because it's still kind of trade secrets until we're in the market and making hay so to speak.

Weber: But from the user's point of view easy and transparent?

Clark: From the user's point of view is no more difficult than using a password. You've got to compete with the ease-of-use of a password. Otherwise people won't use it. And if you can say, by the way, you don't have to remember this, it's automatic and it can't be broken. Lots of companies are interested in that because there's a huge amount of fraud from password account takeover. I think I read McDonald's has half a percent of their revenue is lost to account takeover. And that's just in that market. And there's many, many, many markets it applies to. The entire world uses passwords-- not all the world, 99.999 percent of the world use passwords and we would like to make that a low number. But you've got to do it in stages. You've got-- the most effective ways-- there are effective ways to go at it. So, I don't want to be talking about the new company strategy but it is dedicated to eliminating passwords altogether.

Weber: And it came out of CommandScape?

Clark: The inspiration for it began at CommandScape. I forced CommandScape to have no passwords, and we did but we did it using traditional route. Then we left, and after some more independent thinking we came upon these new ideas and patented it. So, it didn't really come out of CommandScape but that was sort of the genesis place where we were first trying it, but just like everything else it might fall on its face. No guarantees in life.

Hancock: You've talked about how your different visions as far as technology have become real and serve markets and customers. You've also talked a bit about how you learned-- as a first-time entrepreneur you knew nothing about finance and then became much wiser about how you interact with

venture capital. And subsequently you've been able to use your own funding for investments. Do you want to talk about how you have evolved your approach to financing for entrepreneurs?

Clark: I venture that most entrepreneurs are at least street smart. I was pretty dumb businesswise truly. I mean to give half the company for $400,000 or $800,000, I guess. I could've gotten a better deal if I had not been so impatient and so on. But you've got to start somewhere and I started there. And I can't look back. Look all along the way you learn things about finance. You learn everything from what's preferred stock, common stock, what is the value or the ratio of common stock valued at preferred stock? Why is it called preferred? Market capitalization. Financing. Roadshows. It's a wilderness of things you go through and you come out knowing you've learned something. And so that's just learning by doing. So, yeah, I've got a huge amount of knowledge learned that way, not formally acquired, not by going to business school. I have a respect for people who go to business school, but I don't respect people who come out of business school and think they can now-- you know, that think they're God's gift to venture-capital.

I mentioned one a moment ago who thinks he's got all of these skills and he doesn't. And how do you control people like that? They just have to learn on their own. Eventually they realize, "I'm not getting anywhere with this approach." You carve them off and you just ignore them. That's what you do. You just say, okay, you sit over there and rattle and we'll get our business done here. But, you know, a lot of it you can learn. That's what business school is about to some degree. You study finance, you study business cases and so on. But the world is built of people with multiple talents, different talents. Some people are good at managing. Some are good at ideas. Some are good at finance. Some are good at marketing. And, yeah, it's why business schools and companies would much prefer someone go do some work somewhere before going to Business School -- develop a real sense for business.

There's countless Harvard, Stanford, Wharton MBAs who come out and think they're God's gift -- and I've had a few of these on boards. I was on boards with people who were fresh out of business school, rarely, but they'd usually come in with a more senior partner. And there's a lot to be said for experience, but there's a lot to be said for education. So, it's just no matter how you start it try to value all of it in some way. It's rare to have someone who totally gets the whole picture. If Bill Gates had gotten the whole picture he would have invented Lotus 1-2-3. You know what I mean?

There's also just business is cutthroat. He was cutthroat. He said, "We ought to build that ourselves." He put Lotus 1-2-3, Lotus Development Corporation out of business. He put Netscape out of business. It truly is cutthroat. Yeah. I don't know what else to say.

Hancock: I have a couple of more questions. Marc, we are coming on the last bit here. Do you have anything else that you'd like to ask at this point?

Weber: Related to the investment that may be too specific, but do you consider what you did with @Home, was that an investment? Would you consider it one of your companies?

Clark: No. No. I wasn't involved there. @Home was TJ. I never actually made any investment in @Home. In my opinion, the board member from AT&T had controlling interest in @Home ultimately, eventually.

And that board member was terrible, and he ruined the prospects for the company. He certainly didn't allow them to blossom. And I think he was not thinking on behalf of all shareholders, but he was worried about AT&T's interest and his own personal interests. That's the problem with getting corporate investors in a company. They have a different set of objectives. Their objectives are their own corporation. They put some money into you and there is some ulterior motive, normally. If you're lucky their ulterior motive is to make money and not have you be part of them. So, they're looking for the same exit as a venture investment would be or as employees are looking for, reward.

Weber: Then the merger with Excite made it worked out to some extent.

Clark: Say again?

Weber: With Excite it became-- I mean they both got value from that.

Clark: I don't know. Does @Home Networks exist? I don't think so.

Weber: And then we didn't talk about really about Healtheon at all. Should we go through the basics of it?

Hancock: I think he kind of indicated that…

Clark: Healtheon started out as a desire to simplify enrolling in your health plan or enrolling… Even today, you ought to be able to carry something that has your identity on it and go in and stick it in something and not fill out a whole bunch of paperwork. You should have your medical records, all of that. Why on God's earth isn't that the case today? So that's what I wanted to originally do. And I recruited a bunch of Indians who used to work for Silicon Graphics, because I was friends with them. They had missed out on Netscape. And they worked really hard on trying to put some meat on those bones. But it eventually turned into kind of like billing and clearing service, and Web site. I mean you adapt to what you've got to do. And @ Home, obviously-- I mean not @Home-- Healtheon merged with WebMD. And a fellow named Marty Wygod took over as the CEO, eventually. And in 2008 when the market blew apart, I sold all of my Healtheon/WebMD stock. I wasn't on the board anymore. So I lost interest. They continue to exist. They run a website. You can go there and find out healthcare information. And I'm sure they make money advertising like most websites.

Hancock: At the time Healtheon went through that boom time you had investment from, I think, NEA and Kleiner. It's market valuation did shoot up.

Clark: At one point I had probably $1 billion in Healtheon stock, WebMD stock. Do you know what I got out of it? Sixty million.

Hancock: But the distinction still was, I think, that you were…

Clark: I had $30 million in it so it's not like…

Hancock: The 2x isn't bad. I think you were the first entrepreneur to have 3 "billion-dollar valuations", though, is that right if you were to count this?

Clark: Yeah. That's what Michael Lewis said. I never really…

Hancock: Do you think about that way?

Clark: I don't. No. You need something to sell books. You know?

Hancock: I was just curious how you… People write about their views, but really what really matters is how do you measure your success.

Clark: I'm glad I had one good financial success. It does make a difference in life. But I've got no complaints financially. But as anyone will tell you that has made money, it's not the end all of everything. I much prefer having a happy home life with happy children, those sorts of things. And being respected thinking-- respected intellectually as an academic, as a thought leader of some kind. Those are the things that matter more to me than another success.

But there is a part of me that's driven, and that drive continues. And I can't even explain it. Why do I give a hoot if people use passwords? It just bothers the devil out of me. You know? I just hate it. It's the most irritating thing in life! Passwords! And I feel partially responsible for that. And so, I just want to improve it. And I don't want to do it for free. So, there's a business element in there. Look, I'm 75. By the time I'm 85, I'm not going to be thinking like this, but I still have some drive. I get tired more easily. But it's a drive. And that's about all I can-- it's kind of the force that pushes you along in life.

Weber: This is reminding me a little bit of -- Sandy Lerner told me that she didn't do anything for its own sake. It was to solve a problem, like something that bothered her. Does it feel like that to you?

Clark: Every entrepreneur is solving some problem that's bothering them.

Weber: But it irritates them that it can't be…

Clark: Yeah. You want to change it. This is absurd. It shouldn't be like that.

Hancock: You've had other areas of your life that you've been world-class in art, in real estate, in sailing.

Clark: Oh, sailing. Yeah, I've done…

Hancock: Do you want to talk about sailing? We haven't talked about sailing. We can't miss this.

Clark: I've gone through this sailing thing. Fifteen years is enough. I first had a small boat. Forest Baskett got me into this.

Hancock: Yeah, he got you.

Clark: He showed me his little 35-foot Baltic and I thought, well, I'd like to have something like that. But it seemed a little small. He used it to sail around the Bay. So, I bought a bigger, you know, 55-foot Baltic. And I sailed that for a couple of years. And then I thought I need a bigger boat. And then I got a 95-foot Yongert, a big heavy steel tub. And I went to the South Pacific with that and came back. And I saw Bruce Kats had a boat called Juliette and I said, "that's a beautiful boat." I'm going to build one of those by the same company.

So, I hired the company to build the boat. I built a bigger boat, 155-feet. Shortly after that was launched Netscape went public and I thought, well, I've got to build a bigger boat. And I built a 300-foot 3-masted schooner. I finally overdid it. And so, I held that for a long time. I finally sold that to a well-known person that I'm not going to tell you, a very well-known guy. And he loves it. He's a designer. He has great taste. I just got a beautiful letter from him the other day -- he's a very eloquent guy. And he was just so glowing about the boat and how much he loved it, how much he appreciated the amount of energy that went into the engineering and design and all of that. He says it's still as beautiful as ever. And I was thinking, now, I did something. This guy is complementing that.

But then I built a racing boat, a 100-foot super lightweight record setter, and I went around and broke the Sydney Hobart record. I broke all of almost all the main records around the world. And then a couple years later, I sold that because it was costing too much money to race. It required 20 crew having to fly around the world to do all these spaces races and that's expensive. So I got tired of that.

Now, I own a simple copy of Endeavor II, J-class racing boat, but it's from the 1930s. It's a gorgeous elegant looking boat. And I can't take a bunch of people on it because it's not big enough. So, I take my family and my daughters, and we have a good time. That's my only boat. It's nice to have been through that, but I have wasted more money on boats than most people ever hope to make. And I look at it and say, "we had a lot of fun." I went around the world a couple of times. I dived in every possible place. So, I've got that going for me, I guess. No, I love boats. But I'm tired. It's just the expense of owning. I suppose if 2008 hadn't happened I would probably still own it because it's…

But the other thing is I have two children now. And I can't use it like I did when I was going around the world. We were using it one month a year. It's an expensive month. And it's an expensive headache because 20 employees, very well-paid, all of the maintenance and the headache and I didn't charter it -- maybe twice. I chartered it once to a bad New Yorker. A well-known New Yorker who HAD similar boat that caught fire. So, I chartered it to him, that particular summer for a month. And he spilled tea on the rug in the living room. He went to sleep. And he woke up and his tea was sitting on the floor. Right? He woke up and didn't even think about it and put his feet on the floor and knocked over the cup of tea. He wouldn't pay for it. And I just thought this guy is one of those kinds of people. You know? I would love to say his name because he's such a jerk, but I'm not going to.

Hancock: Your decision. We've talked about people that have been influential. You've mentioned people that you've admired. And maybe some of the people that mean most to you. Do you want to add anybody

to that list? Any stories that we haven't told about some of those relationships that are really important to you?

Clark: Who do I admire? All of my mentors. John Hennessey, what a guy to be an office partner. And then he goes on to arguably the best President of Stanford ever. Forest Baskett, one of the smartest people I've ever met. He's just a terrific guy. He's a little bit older than me and a phenomenally nice, soft-spoken brilliant guy. Jim Barksdale, I love that guy. He's just an all-around good man. Full of aphorisms. I can't even think of them right now. But he's got so many little Southern sayings. But TJ my partner, great guy, best friend ever. There's just so many people. Ivan Sutherland. Chuck Seitz. David Evans. Even my physics professor back when I was in LSU. Charles Head.

You go through life and there are certain people that kind of change you. He was just a professor, but it was his style. And then Ivan and Dave Evans and those guys that -- these are sort of way-points in life. Those are real way-points where it made a difference to the way I think, the way I am, kind of like they enlighten me in some way or imparted some of their enlightenment. I won't say I'm enlightened, but I got a little bit of glow from being around them. I try to be good to people. I'm not as ruthless as a lot of businessmen. And I will give way a little more just to get keep peace. I'm not terribly selfish when it comes to that. I still respect these other people that are. Like Jim Barksdale used to say, "You get more with honey than you get with vinegar." Honey draws flies.

Hancock: Draws flies.

Clark: Yeah. Talking about competition, honey draws flies.

Hancock: Are there sayings that people would be quoting, what Jim used to say? Are there things…

Clark: Nothing I've made up. It's all stuff I've stolen from someone else. I use a lot of Jim Barksdale's and the situation will present itself and you'll find yourself saying that he used to say.

Weber: I liked your Eliot quote.

Clark: That one I picked up just from reading. Remember I told you the time I dove into a hole, emotional hole? I was reading everything to get out of that hole and poetry sometimes works. But T.S. Eliot was talking about emotional breakdown and love lost and things like that. But it's such a nice reminder, not a whole lot of point in dwelling on the past. Everything is here, here and now, make the most of it. And that probably is the biggest thing that I learned in life; I don't think about the past. I'll try to figure out what went wrong but just so that I can learn from it. It's not to drag it around and beat people over the head with it -- or myself.

But one of the biggest lessons in life is to just to live in the here and now and get on with it, because you're not going to be able to change that. But, what else? No. I would just honestly tell people if they really want to achieve something, it takes a lot of work. You really have to work at it. We all know and have encountered people in life that you would guess everything came to them effortlessly just because

you think, "Oh, wow, that person is smart". Well, I'm not that way. I know that. Everything I got took a lot of effort. So I guess that means I'm not brilliant but I do-- I work hard. I really am one of the most driven-- you know -- drive is my key word. I'm one of the most driven people. And I cannot identify why, other than my own set of reasons that I've already gone through. You get a lot of drive trying to get out of Texas.

Hancock: It took a lot to get out of Plainview. You and Jimmy Dean. When you think about Dylan and Harper, I believe, your daughters, and you envision the way that they're going draw from your strengths and what you've given them, is there anything else that you would like to add to the story for that generation or the next generation of the museum?

Clark: Well, first of all, I've got two grown children and grandchildren by them. And they were a victim of what I was going through. I mean I was in school the whole time they were growing up. And then for all practical purposes the first four years of being out of school, I was still in school because I was teaching. And so, they grew up without me. But we're all still really close. And they're part of my family, my daughter, grown daughter did very well. She was married to the founder of YouTube Chad Hurley. And she got half of what they owned when they split up, so she's independently pretty wealthy.

And my son is one of the founders of this new company with me so I'm trying to help him become wealthy, too. These two little girls, on their own, I much prefer people do it on their own. But these little girls, five and eight, it's a unique time in my life. I'm able to spend time with them. And I love it. And I love being part of their lives. And I'm on the school board in the school that they're going to, so I'm doing everything I can to contribute to the whole thing, financially, too, helping the school, helping other people to be able to go to school.

And what do we want for our kids? You want them to grow up and be independent, healthy, able to sustain their own life on their own without being trust fund kids. I'm not a trust fund kid. I don't relate that. So, inheriting money seems-- it's a weird conflict. You don't want to be selfish because, obviously, when I die I'd like for my wife and my kids to continue to have a good life. But my main objective is to get them educated. You can give people money and they can buy a meal. What's that famous quote give someone a dollar and they can buy a meal; give them education and they'll buy meals for the rest of their life.

To a large degree I hear all of this stuff, my own little two cents worth, so-called reparations for our racism past as a country. I don't think that's a particularly good idea. I think the thing to do is to make sure that every single person have a college education. Every black person you see had an ancestor of theirs grow up as a slave. Four hundred years ago, 1619, we brought black people to America as slaves. We've got to help them all we can. The reparation is you make damn sure they have all got a good education, and we're failing when we don't do that. And that would be my goal -- if I were in politics, I would argue for that because I know what it means-- what it meant to me and I grew up dirt poor. I mean my mom would send me and two of my friends to the supermarket with $0.25 apiece to buy three cans of biscuits because you could buy them three cans for $0.25 but that was your limit. So, we'd go in and buy it, and I guess that's what we ate for breakfast. And it's not easy. And you look at every person, I don't care what walk of life they're from, they deserve to be lifted out of that. I had the wherewithal to lift myself out of it, but not

everyone does. You've got to give them a hand. And that's super important. It's the kind of society I want to be a part of.

But it does take work. But the first thing is you provide a free education, help them learn to learn. And then it's self-sustaining, when people realize the reward in developing knowledge and acquiring knowledge. There's a book called -- I think it's called "Educated". My wife gave it to me. She's been saying, "You should write a book." I feel like I'm not ready to write a book. I would rather be part of getting rid of passwords than writing a book about me. But there's an inspirational message in doing it the way I did it. I wouldn't recommend it for anybody. I'd rather see people get an education, learn the value of education when they're young and provide them the resources to get the education. Put them through school. I'm much more in favor of giving people an education than I am giving them money. And I think everyone should go to college. Why not?

There are people who say, well, they can't get through college. Well, how do you know? I think there are a lot of people whose mouth went agape when they learned that I had become a professor at Stanford. It wasn't what people expected of me, but it pays off. So that's my main message to the world is don't just be smug in your own ability to have an education because you came from a good family. Bill Gates, for example. Worry about those people who don't have that opportunity and fix it. That's how we're going to be a great country. Don't you think?

Weber: If you had had an easier education, you had gotten a good education at the start, would you have become an entrepreneur?

Clark: Well, you know, I don't think you can answer that, but I kind of think your personality is inbred. I say it's from drive trying to get out of Plainview. Part of that's in jest. Your character is kind of what it is. There are things that I should've learned in high school that I still don't know. The Greek classics and certain things that you learn along that way. I don't know them, and I'd like to, but I don't take the time now to do that, even though I read quite a bit, but I don't go back and read the Greek classics. Sort of apropos to your or pertinent to your question — I was in the audience where there was a panel of people who were talking about, or worshiping, Facebook. It was one of the early people at Facebook. And they were just marveling, they were bunch of venture guys, and they're marveling at how… This one guy was raving about how people spent 10 hours a day on Facebook. So, I said, "Do you think if you had spent 10 hours a day on Facebook you would've done what you did?" That was like tossing a stink bomb on the stage. People were like who brought this guy?

But it's the way I feel. You kind of get what you work for. And if you want to waste your day on Facebook, so be it. I'm not a Facebook user, and you can call me an old fogey, an old-fashioned guy, but I know how to program probably better than 90 percent of the programmers out there, because I spent years and years and years doing it and refining it -- it's an art. I'm probably getting a little slower at it than I used to be, but it takes effort. Everything requires effort. And you get what you put in, in my experience. And don't expect things to just fall in your lap. One way or another you're going to have to work for it. And you won't get it on Facebook.

Hancock: This seems like a natural way to finish. Thank you so much, Jim. On behalf of CHM we want to thank you for the generosity of your time, and telling your remarkable story. Thank you.

Weber: Thank you for the wonderful, wonderful…

Hancock: It was amazing.

END OF THE INTERVIEW