AutoDesk Oral History Panel:
Dan Drake
David Kalish
Duff Kurland
Greg Lutz

Interviewed via Zoom by:
Chuck House and Grad Burt

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Introduction

Charles (Chuck) House: I want to thank you all for joining since we've had a fair amount of time putting this thing together. I appreciate you being willing to do this. Let me put a formal introduction on this. I'm Charles House. I usually go by Chuck. I'll be the moderator for today's meeting, and we're going to try and discuss the first five or six years of Autodesk history.

The meeting is being sponsored by the Software Industry Special Interest Group (SI SIG) at the Computer History Museum (CHM) in Mountain View, California. I suspect many of you have been there. They're in the old Silicon Graphics Building on the corner of Shoreline and 101.

Dan Drake: I've been there about twice because it's a long drive and not a pleasant one, but I appreciate the place.

House: I moved out of there years ago myself, so I could relate to your comment. Today is October 15, 2020, and let me just go in order. We've got Dan Drake, David Kalish, Duff Kurland, and Greg Lutz.

We also have Burt Grad, who's been chair for years of the SI SIG at the Computer History Museum. We're recording this on Zoom. We will do a transcript, and then we'd like you all to edit it and make sure the names are spelled right. Then we'll post the edited transcript on the CHM website under Oral Histories. While no one is probably going to sit and watch two hours of video, we'll probably pull some snippets out from time to time for various purposes as well.

Participant Introductions

House: With that understanding, let's start the meeting with round-robin introductions. Let me start with my own. I've spent a long-time in Silicon Valley and also in other places in the high-tech world. I spent almost 30 years at Hewlett-Packard in the 1960s, 1970s, and 1980s and then bounced around through a series of startups and turnarounds and things like that. Ended at Intel, retiring in 2006 to go run a program at Stanford for a decade that was kind of a multimedia research group.

I'm doing this because I've been on the Computer History Museum board for almost 30 years and I also was ACM President along the way. I think some of you might be ACM members or were at some time.

I'm going to now ask Burt to introduce himself briefly. He won't say much during the meeting, since I will be moderating, but he would like to say some opening words.

Burt Grad: Hi. I'm so glad to join you all and that you're here. I started out with GE in the 1950s working on the UNIVAC I in Louisville, so I think I predate all of you people by a few years. I stayed with GE around 10 years and then went to IBM for the next 18 and produced a lot of programs including CICS along the way. I left IBM in the late 1970s and started my own company consulting for software companies. I had a little over 200 clients over the next almost 30 years. Sterling Software was one of my major clients during that time period as well as Informatics. I've been working on collecting, preserving, and communicating software history for about 20 years now and love it. Thanks to you all for being here. I'll now listen to you guys and Chuck.

House: Thanks to each of you for sending notes about your own backgrounds. Being a Caltech guy who almost dropped out of my third year I can relate to some of your comments. That was the hardest period of my life.

Greg Lutz: What house were you in?

House: I was an off-campus kid because I got married in my sophomore year. But then I was a social member at Page. And you?

Lutz: Dabney.

Autodesk Founder Greg Lutz

House: Anyway, you all sent nice notes. Dan followed up with a lengthy one this morning and I appreciate that. For the record, why don't you each do a snapshot where you were born and raised, how you got into the computing world, and when you joined Autodesk. Greg, why don't we start with you?

Lutz: Well, I was born and grew up in Southwest Washington State, in the town of Longview where my mother still lives, incredibly. I left Washington pretty much permanently right after high school and went to Caltech. Did badly. I mean, at first, I did fine, and then I dropped out. I don't know what was wrong. I didn't do well with college. I've never gotten a college degree, as I noted in my bio note After dropping out, I did various little odd jobs and ended up programming at a place called SAI (Systems Associates, Inc.) in Long Beach, California for $3.50 an hour, which was quite a raise from what I had at the job prior to that. That's where things took off. SAI owned or was owned by… Dan, do you remember which?

Dan Drake: SAI owned ISD.

Lutz: Okay, SAI owned ISD [Information Systems Design]. ISD provided a computer utility that ran on a UNIVAC 1108 in Oakland, and I worked remotely on that in Long Beach.

After a year, I got really bitten by the programming bug. I then moved up to the heart of the beast, to Oakland and then Berkeley. I was a programmer at ISD, assistant programmer on the 1108 for the next three years. After that, at the urging of a couple of people including Dan Drake and Keith Marcelius at ISD, I took a trip to Europe and it divided my life in two pieces. I ended up spending three years, most of it in Germany. Came back, consulted for a while, and then it was about time for Autodesk to form in 1981-1982. Anyway, that's a brief review.

House: That's great. I appreciate that.

Autodesk Founder Dan Drake

House: Dan, he invoked your name so you have to go next.

Drake: Right. I will expand on the story of how I met Greg. Keith Marcelius was a founder of this company (Autodesk) but is now deceased. He and I were maintaining that 1108 system with of course no experience in the subject. We picked it up with a computer background, but no experience in 1108.

Anyway, the system one day crashed. That wasn't terribly unusual, and while we were going over the dumps it crashed again. When it crashed for the third time, Keith looked at the information on what job had been running. He called Greg and talked to him. Wound up he was duly impressed with Greg's curiosity, which had crashed the machine, and he promised not to do it again. The computer was unbelievable. It had no protection, no instruction protection, no memory protection. It was built to have it, but it wasn't implemented.

Lutz: Not only that, but its operating system's source code was available online to any user.

Drake: That's right. It was hackable. I won't get into the security problem that I was involved in later on at ISD. Anyway, Keith talked to Greg, and from where I was sitting, we decided to make him a job offer. So that's that story.

Meanwhile, in my life in general, I'm a Bay Area boy from day one. I spent four years at college in Portland and a couple of years living in San Diego in an unsuccessful grad student's role. Came back to the Bay Area because the UC College of Engineering had just opened. It had just changed its name to Engineering and Computer Science. Since I didn't have to learn any electrical engineering to go there, it seemed like a good idea. So, I moved up here and have essentially lived here ever since.

House: Where in the Bay Area were you born?

Drake: Actually, I'm a California boy. I was born in Los Angeles, where my parents had moved because my father figured the war was coming and he wanted a job that would protect him from being drafted. He worked for a while in LA and then came back to the Bay Area. All my conscious life was in the Bay Area.

College Educations of Autodesk Founders

House: Was your college Portland State or Lewis and Clark?

Drake: No. I was at Reed College. I managed to get through four years at Reed, slightly over four years, and got a degree. I note that half the people on the call right now did not have any degree and were all extraordinarily valuable to the company.

House: Degrees didn't mean that much at that point in time.

Drake: Yes. I was the odd man out. I was the only person with a postgraduate degree in computer science in the entire company. We had a couple of physics PhDs if I remember their fields correctly.

Duff Kurland: And biology.

Lutz: What was Kern's PhD. in?

Drake: I thought he was physics.

Kurland: I thought it was math. Could have been physics. Hal Royaltey was I think Biology.

David Kalish: Actually, I have a master's in computer science, too.

Drake: Oh. I didn't know you had one. Okay, that makes two of us. As they say, keep learning things.

House: We had a meeting at HP one time, and we had the President of Bell Labs talking to us about the time they did the divestiture. He said, "We have 600 PhDs in computer science," and we had like 30 at HP. Somebody said, "That gives us a 20 to 1 advantage."

Dan Drake's Early Career

Drake: In any case, I took one or two jobs, and then I got working at this company in Oakland that Greg has already mentioned, Information Systems Design, as it was called. Very soon I was doing systems programming on the 1108, which was a very interesting machine. After that, I got generally fed up, especially when they moved to Santa Clara, and I decided not to move with them, and because I liked it too much in Oakland. I hung around doing some odd jobs including at a company called Tinsley Laboratories, which made optical equipment. They were responsible for the mirrors in this Keck big, fat telescope, by the way.

Lutz: Was that at Caltech? No, Keck Observatory; it's not at Caltech.

Drake: Right. It was an early example of multiple mirror telescopes, which have a bunch of highly aspheric mirrors focused together to make the giant surface.

Anyway, I left. John Walker and I had met in fact at ISD. We both were at ISD for a time. In fact, I remember the interview with him, since John is a major feature player here. Our Manager of Programming Services took a tour of the United States to see installations that had started using the brand-new operating system for UNIVAC. It was called Exec 8, and it actually had memory protection and instruction protection and good stuff like that. A very fancy machine. Took a long time to make it work. So, he went around to see them and naturally, being a good manager type, he was taking notes all the time.

When he got back and management made the decision to switch over to Exec 8, they started calling people who had impressed them. One of them was this guy from New Jersey, John Walker. Keith Marcelius and I were told to interview him and see what we thought of him. When the manager, Bob Larribeau called us in to ask our opinions, we both asked, "Can we take away his return tickets?" So, he was hired. John and I both left ISD on our own schedules. He started a little organization, essentially a one-man organization, to do hardware and software for microcomputers. The one we used was the Texas Instruments 9900 or 9000. I forget which.

Lutz: I think it was the 9900. Yes, I think it was that.

Drake: That was a very interesting system which had a real instruction set unlike the other machines that were dominating the market. Very tractable and programmable. We, mainly John, actually got an operating system going for it which had all of the features we wanted in an operating system as of that date. We were selling those. I joined him and we were selling those, but it was obviously going nowhere. He took a trip to LA and saw Sony had just decided that it was going to make a personal computer. He saw some of the action there and the amount of stuff that was being geared up and the fact the big companies were actually recognizing this stuff and said, "We ought to be providing software for that since we know how to do the software." We started calling all the people we knew and that's the germ of Autodesk. I guess that covers my early history.

House: That's great coverage.

UNIVAC Connectivity

Lutz: If you'll pardon me, there is one more little story about ISD that I'd like to throw in. Probably before I left to take my trip to Europe, ISD acquired a second 1108 and there was really no way for the two to communicate with each other. They were not part of a standard multiprocessor, and with some help from I think our maintenance, the person that maintained the computer physically, we managed to hook two of the big channels back to back. I think it was a huge cable about the size of a Romex cable.

They're not supposed to be hooked together that way. I mean, the UNIVAC always wants to be the master and so we had two masters on the same channel. I wrote a little piece of code which I hoped they might be able to talk to each other. It was extremely defensive. Every byte that went through would get checked, and if it didn't go through it would get resent, but it worked. Managed to get some data across, sort of a proof of concept. John came in shortly after this and took that as the basis for what I guess you'd call a loosely coupled multiprocessor between the two. I just couldn't believe that that piece of code was the communication line between the two.

Drake: Yes, a very memorable story. I remember sometimes I was in early in the morning, and we had a necessary job of switching operating mode. At night we had it running as a single processor, and in the morning, we would have to reconnect these cables, which is not a thing to want to do every day. We would disconnect the cable and reconnect this cable and make sure it worked and boot it up. I've got a thousand of those 1108 stories, but it was ingenious and it showed the kind of brains that, if I may say so, went into Autodesk.

House: Well, these are the kinds of stories we love to glean, so thank you very much. That's terrific.

Autodesk Founder Duff Kurland

House: Duff, can we hear a bit about your early history?

Kurland: I was born in New York in the Bronx. I grew up on Long Island and had an interest in electronics. I was a ham radio operator for a while. I studied electrical engineering at NYU [New York University] when they had a campus in the Bronx. In the early 1970s, they got into big financial trouble and had to sell the campus, so it is now part of Bronx Community College, I think. Anyway, although I was supposedly studying electrical engineering, I spent most of my time at the campus student radio station and the only course that interested me at all in my sophomore year was an introduction to Fortran course taught by Alvy Ray Smith, who was one of the founders of Pixar.

At the end of my sophomore year, I dropped out. I started working at the campus computer center as an operator. I taught myself assembly language and a couple of other languages besides Fortran and was doing programming assistance for the students in the area. When the systems programming staff left, I was the only one around who knew assembly language.

Lutz: What computer, Duff?

Kurland: UNIVAC 1108.

Lutz: Oh, no wonder. All right.

Kurland: I worked there for five years and wrote a bunch of code. The UNIVAC user group got together twice a year. It had these national conferences and we got to know each other and exchange code, so my code got known. That's how I met John Walker. As you say, he was working in New Jersey for a company called Axicom Systems. I also met Kern Sibbald who was with the University of Maryland at College Park, and they were running 1108 systems. I got recruited then to come out and work at ISD. A couple of people from New York and from NYU had preceded me. Dick Kent had been at NYU and there was a guy, Bruce Cohen. He worked for UNIVAC in New York. Bruce and I had traveled to California in 1974 for vacation and spent a couple weeks going up and down the coast. We really liked it, so he moved out to Santa Clara to work at ISD and I followed him a year later in 1975. That's where I met these other guys here.

First Autodesk Employees

Kurland: Most of the Autodesk founders, I'd say a good 80 percent of Autodesk founders, were ISD employees. I joined Autodesk at the beginning. I guess I moonlighted for a year or so. I think maybe Greg was the first, actual official employee.

Lutz: Yes. That was the result of my running out of money and taking an outside job which upset everybody; so, they decided they had to pay me a salary.

Drake: A very small one.

Lutz: But I thought it was huge. I think it was something like $1,000 a month. I mean, my God.

Kurland: Yes. Prior to Autodesk, I think David and you and Mauri and I and maybe a couple of others had formed a company called Pacific Software Associates.

Kalish: Yes, doing consulting.

Kurland: We were doing software for John and Dan's Marinchip Systems company. I don't recall anything actually coming of that. It kind of faded into nothing.

Kalish: I think we had a project for Richard Handyside.

Lutz: Oh. Wow.

Marinchip Systems

Kurland: The other group of Autodesk founders would be users and dealers of Marinchip Systems.

House: Okay. We don't have any of them in this call.

Drake: Yes, I didn't mention Marinchip. There are too many details here, but yes, John started this operation. I thought I was going to talk about it, but I forgot about it. Yes, okay. By the way, in case anyone is not familiar with Sausalito history, there is a street called Marinship Way with an "S." It's a good story because right after Pearl Harbor a couple of financial and industrial types wrote to the government and said, "We could get a shipbuilding yard going in a matter of a few months." The government took them up on it, and they shipped their first ship in about three or four months, after the papers were signed. They kept cranking them out, this company was called Marinship with an "S." That's where the name of Marinchip came from. We in fact occupied quarters that were at the edge of the Marinship site for several years.

Kurland: These were the Liberty ships.

Drake: Yes, the Liberty ships were their specialty.

First Legal Case Charging Criminal Violation of Software Rights

House: Duff, did you complete your story, or did we interrupt?

Kurland: I think I basically completed it. Although I would like to do a hook back to ISD and suggest that at some point Dan and Greg should tell the story about the lawsuit with CSC or United Computing?

Lutz: Not just a lawsuit, right? They were the ones that were charged with criminal violation of software rights.

Drake: Trade secrets theft.

Kurland: As far as I recall, this was the first occurrence of a computer memory being subject to a search warrant.

Drake: Yes. Right.

House: You guys were on the ground floor.

Drake: That was another thing that Keith Marcelius, whom I've mentioned repeatedly, was involved in. We had several remote customers running batch jobs, remote card reader and printer things, largely overnight batch computing jobs for companies including Shell Development in Emeryville or somewhere. One of our salesmen wandering around that site noticed a deck of cards that didn't belong on that site. I forget the details, but he recognized it as a deck of ISD stuff. A little investigation showed that they had a guy there on the staff who raided our site and pulled off some code we had that they wanted. It was plotter running code.

Foreshadowing our ingenuity with that kind of thing, we had a hardware guy who reverse engineered how to run the HP plotter and put together code that would run the HP plotter. That was a competitive advantage, and these guys stole it for their much larger company that was unable to compete with us.

When it hit the newspapers, the cops did a raid on it. They found some very bright cops to get involved in this, although they didn't know computers. Keith dealt with them and Greg did to some extent, so I should probably get him back into it. I remember the day it hit the headline. Some of us went out to lunch and saw the headline in the *Chronicle* morning edition outside the place where we were going to eat, which I swear had a subhead, "rape of computer by telephone." There it was, our story. Of course, when the international phone calls started coming into our management, they were totally unprepared for this and stumbled and muttered.

Then we went on to some security things, and we embedded some rather more secure things and ways of protecting things. Of course, we had the evidence gathering thing. There was a search warrant to search every disk in their installation for evidence. That was unprecedented.

House: Dan, what year was that?

Drake: Oh, golly, I ought to remember that, but I don't.

Lutz: It should be 1971 more or less.

Drake: Yes.

House: Okay. That was pretty early.

Drake: Yes, that was it. Somebody at *The Chronicle* I guess was going over the police records and saw this weird thing and somehow recognized that it was a weird thing.

Lutz: I'd like to throw in one little detail in that. Some code of mine was among what was stolen. I had written the communication code, which is kind of byte-fiddling code. One of the things that I did in it, which nowadays is really not kosher, is instruction modification. We plugged that in. It took out an 1108 instruction word and replaced the bottom half of it with an address as part of this modification. Initially, it didn't work right and then I remembered that there's not only an instruction in the bottom half of an 1108 word; there is a thing called an increment bit that said is when you run this instruction you also have to increment the value in the index register. Upon finding this out and fixing it, I was rather annoyed and put a comment on it that said, "Don't forget the damned increment bytes." That comment appeared in the trial and that bit was used as kind of notable evidence that this was indeed our code.

House: Oh, yes. Those are exactly the way the early code breaking got found.

Autodesk Founder David Kalish

House: We've left David out of the discussion here so far. David, you want to give your info?

Kalish: Sure. I was born in Elizabeth, New Jersey, and went to college at NYU Business School, where I took a statistics course that involved Fortran programming and fell in love with programming. I used to hang out at the "Computer Center," which was a very small single IBM 360. But I don't remember exactly which model. I was actually helping the MBA students with their programming because they didn't know what they were doing. Not that I did, but I understood their programs well enough to help them out.

After NYU, I was part of a group that started a commune in Upstate New York that quickly disintegrated over the summer. I had gotten a job at Cornell as a statistical programmer. I wasn't sure what that was, but what I did was rescue their giant amount of research data held on punch cards from the basement, which was sort of wet, and put it up on tape so that it would last for a while.

Then beyond that, I worked with the Princeton Testing Service that did the SATs on how to do Mark Sense, so the next time they collected the data it wouldn't be on punch cards and it could go directly to tape. That was a short stint.

From there, I moved back to New York and drove a taxi cab for a while and then went off to Europe for about six months. When I came back, I realized that I either needed an experience

or another degree to get a job in computers, so I went to Wisconsin to get a graduate degree in Computer Science where I focused on compiler generation. That was two years.

I had been to the Bay Area briefly and really liked it, so I decided I wanted to work in this area. What I did is I used the PDP-11 that we had to generate my resumes and sent out a mass mailing to about 20 companies, and I got a stack of computer-generated rejections back from a lot of them.

ISD was one company that was interested in me. I went out and interviewed and so did two of my friends. One of my friends got the job and I didn't, but he decided he didn't want the job so I quickly called back and then got the job, which turned out to be working on phone support. This is ISD in Santa Clara where none of the other people except for Duff, I guess, worked. Dan, you didn't work in Santa Clara, did you?

Drake: Right. I had a 10 by 10 office that I never went to down there. I commuted between them sort of.

Lutz: ISD made the move from Oakland to Santa Clara while I was in Europe, and I never went back to ISD.

Kurland: That's a little funny, because I'm absolutely sure that I met both Greg and Dan at ISD in Santa Clara.

Drake: Yes, I definitely met you at ISD. I remember that. You were one of the new fixtures in the company, and I knew people around there. Mostly, I knew all the people around there because they were people who had moved down from the Bay Area.

Autodesk Founders and ISD

House: You had all gotten together at ISD long before the idea of Autodesk showed up?

Kurland: Yes.

Drake: Yes.

House: How many founders were there? There's 16, is that the number I hear?

Kurland: Well, there's 13 in that founders' photograph. My ex-wife was briefly a founder, but she left quite early on. Then I guess you could consider Mike Riddle and maybe Jack Stuppin.

Kalish: Jack Stuppin was not in the photo.

House: Mike Ford's there, but Mike Riddle isn't in the photo

Lutz: I think I can see Mike Ford quite clearly.

House: If you could send us a good copy of that, that'd be great.

Kurland: I have it online.

House: Okay. So, it sounds like this all took place over a decade or so at ISD where you all got to know each other.

Lutz: It wasn't quite that long, was it?

Kurland: It was their facility. I went there in May 1975. Autodesk, you know, we started talking about it in 1981.

Kalish: I got there in 1975 also.

Lutz: You went to ISD in 1969 or so, didn't you, Dan?

Drake: No, actually, I joined ISD in 1967 or 1968. I think 1967 was when they were in the Sumitomo Bank Building in Downtown Oakland before they moved out to near the airport.

Lutz: By the airport. In fact, the building they were in after that, and the only place I ever worked for them, was the Oakland Raiders Ticket Office.

Drake: Yes. Right.

Founding of Autodesk

House: Let's fast forward to the founding of the company and describe how all that happened. I don't know how to ask the question, but there had to be a momentous something. Did you have a big party, or was somebody moonlighting on the side and ISD knew about it, but they didn't worry about it? Tell me what went on.

Lutz: Dan, you should do it because you were part of it. You were one of the spark plugs.

Drake: Okay. John Walker had this essentially one-man shop, building an S100 bus, which supported the TI 9900 series.

Kurland: That was significant because that was a 16-bit chip.

Drake: Yes.

Kurland: He also had to invent the method for doing 16-bit memory transfers on the S100 bus.

Drake: That's right. Of course, it was this great big, long fat chip which was not easy to replace. Anyway, he designed that board with help from a guy who knew hardware who wound up not joining Autodesk. We were shipping those things and developing software for it. That's the time I developed a tape driver from the bit-level up because that's all there was in the hardware. It had to access the bits one at a time. That was very interesting, but fortunately, that's sort of what we did.

John went down on some trip and saw a bunch of activity from big corporations including Sony with plans to use these little microcomputer chips. I am not sure where in this sequence the IBM PC was released, but IBM didn't know what direction it was going in any case. He decided we knew software, he and his network of friends, and we ought to be doing a software company. He had had this one venture, and there was really no place for this one to go with the hardware, so that's the founding story.

We got in touch with all the people we knew, mainly people from ISD as you might notice, and found out who was into it and who was not. Eventually we started talking with people in the venture capital business, such as finding out what form of organization we were going to have here and what were the plausibilities of that and spent a number of weeks seriously discussing it. You can find out a lot more about this if you look at John Walker's site, at the Autodesk File.

House: Yes, I've looked at some of those.

Lutz: Information Letter 1 was the real kickoff.

Initial Funding

Drake: Eventually, we did decide that it was going to be an ordinary, conventional corporation because that was what the government wants you to have and why fight it. So, we organized it and obtained notable services from a notable law firm and a notable accounting firm. These were actually from the connection with a guy I knew who was a venture capitalist. That was Jack Stuppin, whom we mentioned before. But he is not a person who is well

remembered in the group. We wound up finding out what the formal requirements were and holding a meeting in John's place at 16 St. Jude Road in Mill Valley. That was the organizational meeting from which I date the existence of the company because that's legally what it was. That is some of the prehistory.

House: What was the date of that meeting? Do you have that handy?

Drake: I would have to look it up, but it was in March or April of 1982. I remember 1982 with great clarity.

House: Okay, so it wasn't 1981. But all the preliminary discussions were happening in 1981 it sounds like.

Drake: They started in 1981, right. That's when it really started happening, but it didn't officially happen until that day in 1982 when we collected people's initial investments which were in all forms; you might be trading in at a reasonable value equipment they had owned, computing equipment which would be used by the company. I may get to the legal argument I had over Duff's computer equipment, but it may not be worth spending time on at the moment.

Anyway, we collected all that money and there was a significant amount of actual money. I took the checks down to the bank totaling $53,080 dollars if I remember correctly. Maybe it was $53,030.

Kurland: I recall there being $59,010.

Drake: $59,000? I don't think that's right.

Okay. We're disagreeing on that. Anyway, I took it down to the bank, and that was basically our company's net worth, which expanded quite noticeably through the years. Anyway, that's when it started and how it officially started. We self-appointed a couple of corporate officers and arranged everybody, but most of the people still were holding real jobs. We arranged to try to get people away from their jobs by actually being able to give them some money to work for. I'll leave it to everybody else for that.

Initial Projects

Kurland: We were all working from home, and we decided that somewhere along the line somebody mentioned that 80 percent of new businesses fail, so what we would do is try and beat the odds by working on five different projects. Whichever project hit, we would drop everything and concentrate on that one. I was doing a full screen text editor. I think Hal Royaltey was working on a statistical library. John, Dan, and Greg were converting Mike Riddle's

MicroCAD software to AutoCad, and John Walker was converting Interact to C to make into PL-1. John was converting it to PL-1 because we didn't have a C-compiler that would handle floating point on the Z80 CPM 86 or whatever system we were using. Greg and Dan were converting it to C for the Victor 9000 and the IBM PC. Those were three of the projects. David, what were you doing?

Kalish: I remember I was working on a compiler or an interpreter, I'm not sure, on an Apple II.

Kurland: Kern Sibbald was doing this desktop organizing system called Autodesk.

Drake: Oh, yes.

Kurland: Before graphics.

House: Autodesk was actually intended to be kind of like a Microsoft Office product?

Kurland: Trying to make a card filing system and a database thing. We never got the actual program to work well enough, better than a demo. It was too slow.

House: Just reinterpreting what you said. It sounded like you said if we have five different ideas to go to market, one of them will click and that's the 20 percent odds rule.

Kurland: Yes.

House: So, 16 guys launched five project areas.

Kurland: Except we really have to say 13. One of those, Mike Ford, was our only marketing guy. Was Richard Handyside doing any programming?

Drake: No, I don't think he ever did any.

Kurland: Yes, I think you'd have to say that maybe nine of us were doing programming.

House: Okay.

Drake: No, we had three people working overseas. These were again business connections from Marinchip mainly.

Lutz: Right.

Drake: They established more or less a real and successful overseas operation of which the English one survived. I've walked past their offices in Soho, but I've never had the nerve to walk in and say, "Hi."

Kalish: Wasn't there a fourth person in Europe that dropped out?

Drake: It was Peter Goldman.

House: Are they among the 13?

Lutz: Yes, they are.

House: Somehow, they made it over for the photo.

Lutz: Yes.

Choosing the C Programming Language

House: It sounds like there's a story around Mike Riddle, that he didn't join but he was kind of on the side. What was that all about?

Lutz: Oh, Mike Riddle. He was definitely one of the founders. I don't know how much money he put in, but he was proud of some software that he included, brought with him to fledgling Autodesk, including in particular this program of his called Interact which was, I may say, a primitive CAD program.

Kurland: He wrote it in a language that he had developed called SPL if I recall properly.

Lutz: Right. Not only was it a language he developed, but the compiler for that language I believe was written in another language that he developed.

Kurland: Oh, oh.

House: Creative guy.

Lutz: Well, it's an extreme case of NIH [not invented here] syndrome you might say.

Drake: Another project that I worked on in fact in the early days was possibly converting and adopting his system programming language, which I gave up because when I got into it and saw what it really did and how he handled the design decisions, I was not going to do it.

We made the smart joint decision of picking up on C, which was a new boy in the neighborhood at that time. I don't know of any big important software that was done in C. It was some years after that that Lotus 1-2-3, I believe, was converted to C.

Kurland: Really?

Lutz: Yes, I think so. I was deputized to make the decision of a development language, of what we would convert Interact to and the choices were basically Pascal and C. Pascal was just so big and slow and clunky, and then C was this really trim, low-overhead language, so that's what I liked.

The initial compiler for it we got—I can't remember the name of it—but we knew the guy that wrote it. He was slightly nuts. We got to see the source code for his C compiler, and he was available to fix bugs in his compiler occasionally. Do you remember his name or the C compiler's name?

Drake: No, I've totally blanked on it. You'll probably find it in the Autodesk File somewhere.

Lutz: Anyway, the process of converting Interact to C was kind of interesting. Dan and I took that particular job on and allocated files to convert based on alphabetic order. I think you started from the beginning of the alphabet, and I started from the end, and we worked our way to the middle of converting one file after another from SPL to C.

The Role of Interact and Mike Riddle

House: Mike wasn't involved in that or with this NIH factor. What was his role by then, Mike Riddle?

Lutz: We saw very little of him. He wasn't involved in that conversion at all. I don't even remember if we ever asked him questions about odd things.

Drake: I don't think we did.

Kurland: I don't recall ever meeting him.

Lutz: I did.

Drake: Could be.

Kalish: I only met him once.

Lutz: He lived in Arizona and didn't move to the Bay Area. We didn't see him very often.

Drake: I saw him on a couple of visits here; one of them I think was in conjunction with the Computer Faire. But that was it. We didn't consult. We didn't ask him what he was doing. His algorithms were clear enough, but I would not give him high praise dor any other thing. We just reimplemented everything in C. A pretty straightforward job as I recall, just putting the same stuff in C.

Lutz: Yes, you may remember the E struct, Dan, which you reluctantly carried forward into C the way every so-called entity or object in a drawing was defined by a bunch of numbers in this one struct, called E. That's the way AutoCAD was for the first few years of its life.

Drake: Yes.

Lutz: This one instance of an entity.

First Computer Faire Demos

House: Let me move on from that beginning. You showed the product in Comdex in the fall?

Kurland: Before that I guess there was a West Coast Computer Faire in San Francisco at which Autodesk, the program, was demoed. I don't recall anything else being demoed there. Do you, guys?

Drake: I think that's true. I'm sure we didn't have even a demo of AutoCAD. I do remember the preparations for the Comdex that year because for me it was a series of all-nighters. There was a really nice device that I've got to mention made just north of here. Some startup had a touch pen.

Kurland: Sun-Flex.

Drake: Sun-Flex. That's right, yes. Sun-Flex, thank you. They had an advance or some arrangement with the personal computer thing that was called Sun, not to be confused with Sun Microsystems. We got in touch with them because this looked promising. It involved a mesh that you would apply to the screen on a semipermanent basis. Then you would touch it with this little pen that had a conductive tip. It was a light pen that was a lot easier to deal with than the actual light pen. We realized that that would be great. They thought and we agreed that it would be

great to have a device like that for input so you wouldn't have to put the coordinates in by hand on the keyboard. So, we got ready. We had a working prototype delivered to us about three days before Comdex with a bit of sample code and rules for how to use it. I jammed it in in a short series of all-nighters.

We converged in Las Vegas and put the thing together, and we actually managed to make it work on the floor. It attracted what was for us considerable crowds. We had a little 10 by 10 minimal booth in the back. Farthest back place and right across the aisle from us was a great big well-financed booth for a company demoing Lotus 1-2-3. Probably we drained off a little bit of their crowd. But people showed real interest in AutoCAD because they could see it was actually drawing stuff and making pictures.

Lutz: About the interest in AutoCAD at that show, there's another aspect. Sometime before this we somehow managed to get HP at least minimally excited about our product. They thought, “Cool, you're making drawings on a computer. You'll need to put them on hard copy.” They made plotters including this one huge flatbed plotter.

They ended up lending us one of the plotters for Comdex. I think that was really the key more than anything else to the amount of booth traffic we got because it was really fun to watch this Hewlett-Packard pen plotter make a drawing. It was just zipping around, picking up one color pen after another drawing lines really fast. People would just stop and stare at this thing.

House: I have to stop you there. I became the Corporate Engineering Director for HP in April of 1982 and came to Palo Alto from Colorado. I had a guy working for me named Marv Patterson who came out of San Diego and had done that plotter. I was a draftsman when I earned my way through college. We decided that'd be a cool thing to do, and we heard about you guys. I think Marv arranged for that plotter to be at the show for you. I haven't thought about that until you just brought that up.

Comdex 1982

Kurland: At that first Comdex, this is Comdex November 1982, I guess.

House: Right.

Kurland: This is only six months after the formation of the company. I think that that West Coast Computer Faire may have been prior to the actual incorporation of Autodesk. I think we had a program called Autodesk, but we didn't actually have a company with that name yet.

Drake: That's right. The company name hadn't been settled on.

House: So that begs a question here. You guys were all working at ISD still?

Kurland: No. David and I were and some of the others.

Kalish: Oh, I wasn't either.

Kurland: You weren't either?

Kalish: I left when CDC bought the company.

Kurland: Okay, yes. CDC bought ISD. Yes, several of us were. Mauri and Hal. I don't know, maybe just Mauri, Hal, and me.

House: The point is you were employed somewhere.

Kurland: Yes.

House: You were doing this nights and weekends, the way startups do.

Drake: Yes.

House: Okay.

Kurland: Going back, that first Comdex in November 1982 with the 10-foot booth, I don't know if we had that HP plotter at that Comdex. I don't know.

Lutz: Well, we did, Duff. We did.

Kurland: Okay, all right. We were also showing Autoscreen, the full screen text editor that I was involved with, but there was no interest at all in that.

Lutz: How could it compete with this mechanical monster?

Kurland: Yes. Right. By the end of the show, if I'm not mistaken, each night you were back in the hotel room coding drivers for other plotters and digitizers and mice and for that matter video screens. By the end of the show, we were being demonstrated in 16 other booths.

House: Is that right?

Kurland: I recall that, yes. People, companies were sending us their equipment saying, "Hey, put it on us so that we can show that our computers, our devices aren't toys."

Drake: After that, we even had an informal connection with IBM that got us from their English operation a copy of their Plasma Display system, which really was not very useful. I speak as the person who implemented it there in my basement. It was always unofficial. Our clever marketing director, Mike Ford, made these deals on the side with people who were not really authorized for it, like IBM at Hursley Park [ed. Note: Hursley Park was an IBM research lab in the U.K] I think that was the name. We got a couple of pieces of equipment from them and adapted, but of course it never went into production because IBM was never going to do business with us.

House: Let's stay with this Comdex thing for a minute. So, you're a young company. You got $53,000 or $59,000 bucks in the bank; this would have been in April. How many of you went to Comdex?

Lutz: Probably at least half the company.

Drake: I think so.

Lutz: I remember I drove there with John.

Kurland: Yes, I'm pretty sure I drove with John also.

Drake: I flew there.

Kalish: I didn't go.

House: In John Walker's VW Microbus. I love it.

Drake: Yes.

House: This is a startup in every sense of the word, but by the end of the show, you've got a company.

Kurland: Yes.

Lutz: Totally.

First Product Sales

Kurland: Still, I don't know, for at least half a year or more we were still based in John Walker's home at the top of Mount Tam.

Drake: Yes.

House: By the end of the show, you're on 16 different machines? In some version?

Kurland: Yes.

House: That had to feel like, you know, “Katie Bar the Door.”

Lutz: Different machines, but of course they're all 8086-based. Do you remember the sequencing of AutoCAD 80, Dan?

Drake: AutoCAD 80? It was the first product we actually shipped a paid copy of. John did the CPM conversion to PL-1 concurrently with Greg and me just converted to run on the Intel 8086. We started shipping that before the end of the fiscal year; I remember that. We shipped a few copies of it. We shipped a few copies of the CPM one under PL-1 and then we were shipping probably the IBM version. What was it, a month or two later?

Lutz: Yes, I think like January 1983.

Drake: Oh. Okay. Yes.

Lutz: I have to throw in one more little story here. We had noticed in the IBM PC motherboard there was a socket that was not identified as such but somehow somebody figured out or knew that it was for a companion chip called an 8087, which is a floating-point chip. I don't know why IBM was being so coy about it, but we managed to get hold of an 8087 chip, the floating-point chip. IEEE floating point, you know, everybody's floating-point is standard nowadays, but this was early on. I was the one who got to play with that thing. I got the 8087 and managed to get it running. You had to write code that detected the presence of that chip. If it wasn't there, you did software floating point; if it was there, you used it. It was much faster. Boy, it was a huge difference.

Kurland: You should have seen it on AutoCAD; you'd watch a circle being drawn.

Lutz: Anyway, there's one more thing. We put together a shipping version of AutoCAD with this code that detected the 8087, and if was not there, did software floating point. In my testing, I was always testing if the thing was actually plugged in, so I was simulating the result of the chip not being there to test the software floating point.

I think perhaps the very first copy of AutoCAD that we sold went to an architect, and he complained to us that shortly after getting it, he installed it in, fired it up and it immediately hung. It did nothing at all. It turned out that I had made a serious mistake in not testing this board without the 8087, because the very instruction to test the presence of the 8087, I didn't realize this, but that if it's not there it would happily wait until you got one and plugged it in.

House: Oh, yes. That's a hung board, all right. When you went to Comdex was Walker serving as president?

Lutz: Yes.

Drake: Very much. Yes.

House: Okay. That continued until he left actually, right?

Drake: No. He finally realized, according to his own account, that being CEO of the company was not only uncongenial but would probably kill him at an early age. He decided it was necessary to slough off that role. Then there was an interesting issue over succession.

I want to backtrack a moment here and say that this achievement of being able to plug in an 8087 or not is obsolete now that they have everything built in, but I don't think anybody matched it ever. There were people who would ship something which was hardwired without the 8087 and one which was hardwired with the 8087, and I believe somebody offered one in which you could buy either version. The concept of knowing whether it's there and adapting was unprecedented and, as far as I know, unmatched ever.

Later on, of course, what you did was before we had any documentation on the 8087. Later on, we got the documentation on the 8087. Intel took a long time to release the documentation, it seemed to me. Then I think they gave an official method of finding out whether there's a chip in or not.

Lutz: Well, I think I found a way of detecting the presence of the chip but not to fail catastrophically if it wasn't there.

Drake: Oh, yes, it worked fine. For a couple years, that was what we shipped. I was just saying that we finally learned what the official way was for finding out whether or not there was an 8087-chip plugged in. We didn't know that officially to begin with.

Early AutoCAD Competitors

House: Let me burrow down on this Comdex event a little bit. Were there other people building AutoCAD-like packages at that point? What was the competitive scene like?

Kurland: Wasn't there something called VersaCAD?

House: Oh, yes. I do remember VersaCAD. That was on a big machine, wasn't it?

Kurland: No, I think that was on an Apple. God, I can't remember. It might not have been 1982, but maybe shortly after.

There were major CAD companies around, and I believe all of them prior to Autodesk had strictly turnkey machines. You know, if you wanted to buy their CAD system, you would have to buy their machine.

Kurland: Yes, right.

House: But those were big machines.

Drake: Yes.

Lutz: And expensive, that was the key.

House: Yes. That's what I meant by big, although they were both.

Drake: There were a couple of people selling CAD. I've now forgotten the names. There was one in Pascal put out by VersaCAD. I think the father of the guy who started it was an actual engineer, and the guy who ran it was a computer science student who chose the most scientific, high-class system to write it in, which was Pascal, so of course it was slow.

It was never built with this marketing advantage; I'm going to toss in right here. It was never built to be compatible with everything else such as exporting it or your work to somebody else, some other program. We put that in at an early stage. They were all financed by venture capitalists who really don’t know how to do these things, and I hope I don't start too long a discussion about venture capitalists, but we never took a piece of advice from them that did us any good.

Mike Ford’s Role

House: Mike Ford, you've mentioned him several times. He was your marketing guy or one of the marketing people?

Lutz: He was the marketing guy initially.

House: How did he show up? Had you known him at ISD also?

Kurland: Yes.

House: What role did he play in this set of events and then the naming of the company and as it unfolded? Or should we wait and interview him?

Drake: It would be interesting if you did. He was a small business type that had run a couple of businesses, one of which I think computed insurance coverage or something for companies. I knew him from ISD, and he was the only sales and marketing person we knew who might be available. He took bold actions, some of which were not always to our advantage, but he took bold actions and sold the company and its products very heavily. I don't know what else to say to that.

AutoCAD Pricing

Kurland: How was the price of $1,000 chosen? Is anything coming up?

Drake: Anybody remember?

Kalish: Well, I have a vague memory because I actually worked at the time for a turnkey workstation doing IC design software, and the people there weren't doing very well. They started looking at the architectural market and said the price point for architects was about $10,000 dollars for a workstation. If that's the price for the hardware with the software, the software could be up in the thousands of dollars. I think that was one of the bases for picking a higher price.

House: A higher price being $1,000?

Lutz: Yes.

Kurland: Yes.

Lutz: I mean, there was very little microcomputer software being sold at that time with that kind of a price point.

House: Well, that's true. That was pretty profitable to put it at that price point.

Lutz: Dan, do you remember, was it the very first shipping version of AutoCAD that had the Optional Dimensioning package?

Drake: I think it did.

Kalish: Really? A shipping version?

Drake: That's my impression; I could be wrong. It was certainly very early.

Lutz: Yes.

Drake: I'm sure it was not significantly numbered, a different numbered version.

Kurland: It seems to me that the Dimensioning package was part of what we called Advanced Drafting Extensions, ADE packages?

Drake: Right.

Kurland: That didn't develop until later on.

Drake: Yes, I think the name ADE came later than the actual dimensioning code.

Lutz: Yes. Oh, it did, yes.

Kurland: Really? I don't recall that at all. Dimensioning seems to me something that John Walker came up with over one of the Christmas breaks and was not an initial shipping kind of thing.

Drake: There's a catalog of all Autodesk releases on the AutoCAD website. Autodesk is no longer ashamed of its origins, now that Carol Bartz is gone. There is a nice compilation by some guy whose name does not ring a bell but apparently has been there for a long time. It's worth looking that up. [ed. Note: Shaan Hurley]

AutoCAD Dimensioning Package

Lutz: Anyway, the reason I mentioned the Dimensioning package is that it was a $500 surcharge on top of the $1,000.

Drake: That was really bold.

House: When you say Dimensioning package, what did it do? Did it just reorient where the baseline starts?

Kurland: It was a whole slew of dimensioning commands for linear dimensions and for angular dimensions and for all kinds of annotations that an architect or user might need.

Lutz: This is one of many really major features that John brought in sort of out of the blue. The Dimensioning package was quite impressive. It was a huge step toward what architects really needed.

House: Was he an architect by training?

Lutz: No. Nobody was an architect.

Drake: John commented that the right side of his brain was excised at birth. He could not draw or anything like that.

House: My son used it. He was an architect in training at University of Colorado in about 1984. That program for him was like Nirvana.

Feature Development

House: Aside from John having these epiphanies, how did you guys decide on feature sets and all that? Were customers providing a lot of input?

Kurland: Yes. There were definitely user wish lists, and we tried to implement some of those.

Lutz: There were more feature wishes than we could possibly implement. Particularly early on.

Drake: There was another source of input, which was conversation with the people who had used the program, and conversation with programmers staffing the booths at trade shows; they would show up at the trade shows and work the booths. Over the years, I heard more than one comment on talking to some official of Autodesk. This was very unusual in companies with key people working the floor at shows. We brought back a lot of critiques and useful stuff from those which I couldn't begin to catalog.

House: It sounds like as a team you guys kind of all built this together. In many cases, you'll have two or three people that have done something and everybody else goes out for a

pass, and markets or produces or does the quality testing. This was a kind of a team effort all the way through it sounds like.

Kurland: Oh, yes.

Lutz: That's fair to say. But you could draw sort of a curve with John Walker at one end of it and down to people who had fairly small contributions. There were a whole lot of people in between.

House: Yes. But it was to some degree egalitarian it feels like.

Lutz: Yes, I'd say that.

Technical Group Meetings

Drake: For a very long time, we held every week gatherings at headquarters of the technical groups. Nobody else went to those meetings without special permission, I recall. We would talk over the current technical issues and all that stuff. We were doing that regularly and adapted the schedule to meet the needs of Bob Elman who couldn't drive up on Friday and things like that. But it was a decidedly egalitarian, meeting format.

At various times we had somebody in charge of stuff, but the meeting and the decision process was largely consensual. It would report the bright ideas or in John's case report the new feature he'd implemented over the weekend, and we'd work out what was needed and what features we needed. We assigned people pieces.

I remember a couple of pieces that I did that basically were decided in the meeting. We needed such a feature, and I'd raise my hand and somebody would raise his hand, and we'd implement that stuff.

Kurland: Prior to that, I recall there being monthly, not weekly meetings.

Drake: Yes.

Kurland: Many of us were working from home, and in the early days before we even had an office, there were monthly gatherings at our homes. I remember hosting one or two. I know Dan, you did, and several were at John's. We got together once a month to talk about the progress. Then once we actually had an office we headed up to Marin to meetings. I don't recall, but I guess later on they were weekly.

Decentralized, Remote Work Environment

Lutz: Even after we had an office, the core group of us really only came in once a week and continued to program at home.

Kurland: Right.

House: Is that right? Okay. So, you were a virtual company early on.

Kurland: Yes.

Lutz: Without benefit of an internet, too.

Kurland: Right, right. Yes, well, as I mentioned in one of my emails. Actually, Doug Campbell preceded me doing this but I took it over after. I was the code integrator and basically the source code control system. I would take the changes made by all the programmers, merge them together into a working version and then distribute on floppy disks the resulting new version that everyone would code to.

Lutz: Also, fairly early on, I think John wrote the very first version of this, a program originally called File Tran where two people with modems could send files back and forth to each other.

Kurland: Right.

Lutz: That was pretty important.

House: Wow. This is incredible. I love hearing this story about how you guys operated. I dare say not very many companies were doing that at that point in time.

Drake: Not very many.

Lutz: Yes. That's true.

House: And it worked.

Kalish: Yes, evidently.

Outside Funding

Lutz: Was the IPO the first time that Autodesk got any outside money besides form sales and founders' investments?

Drake: Right. Let me think about that. I'm trying to think of any exception. No, we had a few people who were allowed to buy in early on; people who had actual money to spare and who were not part of the technical operation at all. But those were small and early. Well, small by corporate standards and early. That's right, I think our first actual outside money was indeed the IPO, which was after three years, each of which was at least marginally profitable. Today, you could hardly float a company that made a profit in its first three years: too crazy an idea! Better to be a Unicorn.

AutoCAD Demo Disks

Kurland: Before we go on to that era, the IPO, I'd like to go back to late 1983, early 1984, maybe, and ask Greg whether he recognizes this? It says Preview Pack. [showing a small box of manuals and diskettes]

Lutz: Oh, demo programs.

Kurland: Yes. This was a set of manuals. It came with a set of 10 blank disks except that they had demo software on them. Once you were happy or you didn't care about the demo software anymore you could format the disks and use them as blank disks. Autodesk was included as one of the disks in this 5-1/4 inch I guess 1.2 meg.

Lutz: Oh, Yes, they were 5-1/4 inch.

Kurland: You had to cram AutoCAD onto it, and it included a set of drivers. Who knew what it was going to be using for a screen or whatever? I had to cram an AutoCAD manual into 16 pages of this thing. And there was a $20 off coupon in the back.

Lutz: Do you remember who put this thing together?

Kurland: No, I don't. But luckily, I had this. I looked at the coupon and its expiration date was July 1984, so it must have been probably good for half a year or something. Maybe we did this in late 1983.

Lutz: .

Kurland: One of the other programs on this was SuperCalc, which a friend of mine was responsible for. I don't remember the others.

House: SuperCalc, who wrote that?

Kurland: That is Martin Herbach.

House: Oh, yes, Marty Herbach. He wrote that for Sorcim and Martin was his engineering guy.

Kurland: Okay. Well, I knew Martin from NYU.

House: He was my Engineering Director at Informix. A good guy and a New York crossword puzzle aficionado.

Kurland: Right. He's the guy when Will Shortz was considering a crossword, he sent it to Martin as the last step to determine whether it's a Monday or a Friday puzzle. Martin can do a Monday puzzle in three minutes.

House: Is that right? Wow. Oh, he's a hustler. That's the only way Informix stayed alive for years was with him writing code for us.

AutoCAD on Early PCs

Lutz: Well, I'd like to add one more little thing and it's kind of important. We got an early copy of an IBM PC and for a time we only had one. For some reason, I got elected to have it in my house. I can't remember, but initially I think it had 65K of memory, two floppy disk drives, and that's what we built AutoCAD on. The compiler was on one drive and the code was on the other, and it really taxed that little machine to compile and build AutoCAD.

Kurland: Unbelievable that you could do it actually.

Lutz: Yes.

House: So, the clones of the IBM PC are really what allowed you guys to spread so far and wide so quickly.

Kurland: Yes.

Drake: That's right.

Kurland: Another machine that was really quite something at that time was the Victor 9000. It had speech synthesis and a programmable keyboard.

Lutz: And a weirdly high-resolution display.

Kurland: Although it was just monochrome.

Lutz: Yes. Dan wrote the first driver for that display I remember.

Drake: Yes, right. That was my baby for a time. And don't forget that it had variable speed floppy disk drives.

Kurland: Oh, yes.

Lutz: Right.

Drake: It could store more on the outer tracks than on the inner tracks.

House: The Amiga came along in this period, and it was pretty graphically oriented. Did you ever port to that?

Kurland: I don't think so.

Lutz: No, that was some other CPU. That was 8-bit, I think.

Weekly Design Meetings

House: That's the first three years it sounds like. Then what happened? Somewhere in here John steps aside, and you got a new guy.

Lutz: Al Green.

House: Yes. Tell us about that era.

Kurland: John didn't quite step aside. He went back to programming full time.

House: Okay. Having ideas between Friday and Monday?

Lutz: Yes.

Kurland: Yes.

House: That had to be so much fun for you guys.

Lutz: It really was. The tech meetings when they got weekly, they were something else. The way ideas and designs were handled in tech meetings was quite impressive. I mean, one guy would think of a bright idea, somebody else would say, "That's not going to work. You need to fix…" It was just a lot of intensity that went into them, the design meetings.

House: Are you talking about the weekly meetings?

Lutz: Yes.

House: Given that you were all remote, did you all come in for those meetings?

Lutz: Yes.

House: I think Duff said it couldn't be on Friday because somebody couldn't make it on Friday.

Lutz: He was not a founder but he came in pretty early on: Bob Elman was a strict observant Orthodox Jew. That's why he didn't come.

House: This weekly meeting then was either Thursday or Monday, or did it float?

Lutz: I don't remember.

Drake: No, I think it stayed firmly fixed on Thursday for a long time. We were a fixture at the local Chinese restaurant. A fairly welcome one because we brought large numbers, but not quite so welcome because we made a lot of noise. Ten techies sitting around the table and talking shop.

AutoCAD Sales

House: A couple questions about how the company operated in terms of going to market. Was it mostly a reseller thing or an end user thing? Or how did that all happen?

Drake: Yes, that was Mike Ford's marketing idea, and it was reasonably very successful. It was officially sold only through authorized AutoCAD dealers. Anybody correct me if I go off base here, but the idea was that the dealers would know enough about it to be able to do support work for the people they sold it to, considering their profit margins in selling it. That kind

of worked for a long time, and then it kind of didn't work and as a result we had, naturally, a growing support group in the company.

Lutz: Yes. There was a little gap between the theory and practice as far as the support that these resellers could provide to the users.

Company Growth

House: I'm just kind of imagining in my own mind. March through April 1982 you had 16 people in the company. A year later, how many? And a year after that, how many? What were their roles by that point in time? Can you put numbers on that?

Drake: At the time, we suddenly noticed a little retroactively when the number of employees went over 100, but I'm darned if I remember even vaguely when that was. It was early in the days. It was far along enough that we were in the new quarters, which were actually in Sausalito and not just north of Sausalito.

Kurland: You know, it really astounds me when I think about it. In three years, we went from being in John's place at 16 St. Jude Road to being at 150 Shoreline in Mill Valley. We were there and then expanded to additional buildings there. Then for a short time from the 658 Bridgeway in Sausalito. We were there for probably half a year or something. By the time we went public, we were already at Marinship at 2320.

Lutz: When did we expand to three buildings in that same complex? I think it was before the IPO.

House: What was the IPO date again?

Drake: 1985. I think it settled in July 1985.

House: Okay. Three years and three months after you kind of did the jump.

Drake: That’s right.

House: Less than three years from Comdex where everything went crazy.

Kurland: Yes.

Drake: That's right.

IPO and XOR Lawsuit

House: What did you learn from the IPO. What were the challenges as you did the IPO?

Drake: Let's see. One of the things that the management tried to achieve was to not let the people who were working get disturbed by it. We didn't get them involved at all.

House: Brilliant.

Drake: Let's see. What could be said about it?

Kurland: Well, there was the lawsuit. There was the last-minute cursor issue. What was it?

Kalish: XOR?

Kurland: XOR, yes.

Drake: Yes. We adopted a well-known industry standard of running the cursor on the screen by XORing that shape with whatever was on the screen. It worked very nicely in black and white and mostly in other colors. About three days before we were expecting to go public, we received this nice letter from a patent vampire company saying that we were infringing on their patent.

Lutz: The guy's name was Hemmerick, wasn't it?

Drake: Sounds about right. When we inquired with our lawyers…by the way, the lawyers were Wilson Sonsini. That's unusual for a baby startup, but by that time we had changed law firms from the respectable San Francisco law firm, which really knew how to run respectable San Francisco companies, to Wilson Sonsini, which knew how to run high tech companies.

House: I saw later Mark Bertelsen was on your board.

Drake: Yes, that's right.

House: He was and still is at Sonsini. He was the partner who handled our direct contact with the IPO. John and I went to lots of meetings. I think we went more to Bertelsen than he was accustomed to. You were supposed to leave it in the hands of the experts, and we were entrepreneur types. John wrote a motto once for entrepreneurs sarcastically as, "Go-do

considered shameful." About delegation. Anyway, John and I went to meetings and so did Mike Ford. And as far as I knew, and it seems to be true, we didn't disturb the people very much.

Sales Department Issues

Drake: Also, another thing we didn't do was lose track of the company. Actually, we had one nasty scandal come up at about the time of the IPO. We were being vetted for the IPO. Fortunately, we were able to take care of that without breaking any laws. Anyway, we did not neglect the company and suddenly go bad immediately after the offering as we saw happen to several companies that went public around that time.

House: You can't just say, “Well, we had a scandal and kind of got rid of it,” and not say a little more about it. Come on.

Drake: Yeah, that's right. I've got to try to straighten out my memory. We had a couple of them, come to think of it. I would have to do a long study of it to remember the pieces of it. We had problems with both the sales and marketing organization, and then with a couple of dishonest people in accounting and yet we survived them.

This one involved the famous all-nighter we did to ship out to a really important customer, really important shipments to a major customer type, and it turned out that the sales orders for that were forged by a person in the marketing department. People worked all night and more or less illegally shipped out things with yesterday's date on them after midnight had long, long passed. A big, big effort to get that out, and it turned out as I say that the marketing orders were faked; they were entered by the sales people who needed to make their quotas.

Fortunately, that really didn't have to be corrected because no real money changed hands and so there was nothing legally wrong. Strangely enough, we did not fire the whole department at that time. Eventually, we did get rid of most of the individuals in the sales operation.

Accounting Department Problems

Drake: There were a couple of people in the accounting department that incidentally were not hired by me, but casually hired by the guy who was working with us at that time. Anybody remember the name, the guy whose name I don't remember now? [Drake note: for the record, it was Jim Pugash; he became a Big Deal in real estate, founding a company called Hearthstone.]

Kurland: It'll come to me.

Drake: What's his name had been a personal assistant to Armand Hammer, and he was recommended by our business type person who also got us the law firm and the accounting firm. On another occasion, I'll tell you what happened to Ernst & Young because you probably haven't read it in the papers. Anyway, he hastily hired a couple of people, the Controller and Assistant, and they were both crooked. We lost some money over that, but not huge amounts. It was not big enough to be material and therefore not a required disclosure item in our offering.

Autodesk Management

Lutz: Chuck, I would like to point out that in what Dan is saying there's an implication, although he's not saying it explicitly, that he was an extreme case of wearing two hats. Dan was a programmer from way back, continued to be a programmer, but he also got so deep into the business side of the company. Wasn't there somebody who wanted to learn some aspect of business from you?

Drake: I think there were one or two, yes. I never wrote up my valuable observations from my years in management.

House: I think one of the things that's unusual about Autodesk from my perspective is it basically wasn't run by business people at all. First of all, you've outlined how this whole operation hit the market. You had a marketing guy because you only knew one. The focus was on how to do great programming on a really exciting product. But how a company could get 25 percent net profit for years and grow like a banshee without leadership in a sense, is sort of a puzzle to the great man theory of historians. So, your dual role, Dan, is pretty important to at least explain how this all operated.

Kurland: Wasn't Autodesk *Business Week*'s hot growth company two years running?

Drake: That's right. Two years in a row *Business Week* gave the first and second of its annual award to the hottest new company or something like that. It went to Autodesk, which had such good numbers and repeated them the next year that they ran another item on us. The only time I've had my picture in a major national news magazine.

Al Green as CEO

House: Let's move to the Al Green story.

Lutz: Well, that's going to be Dan again because I'm really fuzzy about the hiring of Al Green. He was a Brit.

Drake: Yes.

Lutz: Did he already live in the Bay Area? Do you remember?

Drake: I don't recall. I have the impression that we brought him up from LA. I don't really know where we got the connection. Somebody brought him in. I don't remember that piece of the story. As you see, I was not a really deeply involved manager in the company.

House: I don't want to rip a scab off here, but from external views, that was unusual, something happened there.

Kalish: Didn't Al come in as a finance person to clean up the mess that had happened in the accounting department?

Drake: That's right. That's essentially it. There were discussions when John announced that he was leaving. One of the possibilities was that I would serve perhaps in a co-CEO operation with Al, who was the managerial type in the company, which I decided wouldn't work. I was reluctant to do that, to take on that responsibility. I don't have the capability of doing the two jobs that John did. Besides, it nearly drove John crazy, and he left the part he didn't like.

So, there were discussions about it, and the discussions I think were held in a very non-egalitarian method among the Gang of Four or whoever it was that were officially holding the meetings and deciding what to do. Anybody else could probably contribute something to that. But that's what happened; we decided that promoting Al to that thing was the best thing we could do, which I think it was. We did and thrived for a while after that.

House: Who's the Gang of Four? Help me again.

Drake: Who was the Gang of Four? I remember that because it was a notable group. Basically, it was the VP types in the corporation. There was Al and Mike Ford and me and it might have been Keith. I don't know; I think Keith had left by the time we were done.

Lutz: John was a member of that group. That was basically the President and VPs.

House: Yes, okay. Again, a pretty flat organization. Not like a bank where they have 12 VPs in every branch.

Drake: Right. I had the term "Executive" added to my Vice President after a few years because we had enough of them that I wanted to state the pecking order.

Information Letter 13

House: You said things worked for a while with Al, and then it didn't.

Drake: I think it related to other people who were there during the discussions, but I had a very strange experience there which everyone remembers in his own version. I came back to my office one afternoon, and there was a paper on my desk which turned out to be Information Letter Number 13. It had gone around. Well, I think I got one through channels and then I think a second one showed up on my desk. One of our bright people decided that this was so important that it really ought to go to everybody. That was the egalitarian thing coming in.

Kurland: Yes.

Drake: When I came down the stairs to the lobby after work that day, there were several knots of people down there furiously discussing this thing, and there was a certain amount of fury. I just have to refer you again to the file, Information Letter 13. They were very clearly discussing this, and I was in kind of an anti-management mood at the time. I was not particularly happy with this, and I had a really interesting tech project that I was working on that was quite engaging, quite occupying. I walked through that and made my way out as rapidly as I could past the vigorous discussions.

The next day I went to the guy who was the manager of the group and said, "I'm not going to work under these conditions. If you want this project done, please find me a spare office I can work in which won't be at the top of the stairs leading to the main door." He instantly did that for me. Good guy. So, I had an office during the massive discussions that IL 13 started, and there were lots of discussions.

Kurland: The Information Letter was subtitled "The Final Days."

Drake: Oh, yes, “The Final Days?” with a question mark. I think the question mark was there. I was in fact working just down the hall from the conference room. There were a couple of all-hands meetings there in which various people presented plans for the company and what it was going to do and basically why Al was going to stop being the CEO. I didn't go to those. I heard the applause and reactions coming down the hall from there, but I was never invited to those because I had expressed my desire not to be. You guys tell what went on during that time.

Lutz: Duff, can you? I remember there was an air of doom and gloom around the company at this time, but I am afraid I can't be more specific. I don't really remember what happened.

Kurland: I think it was around the time that Windows became available, Windows 3.1. You know, we were based on DOS.

Lutz: Pshew. Was that it? God.

Drake: Well, yes.

House: I thought Windows 3.1 was more like 1990. (Ed. Note: Windows **3.1** was released on April 6, 1992; The Windows 3.0 launch on May 22, 1990 was a much bigger production than the original launch nearly four years earlier. Wikipedia)

Porting to Windows

Lutz: We were initially happy to spend the time and effort to port AutoCAD to every computer in the world. We ported it to a Mac, and we ported it to a strange Unix machine. It was 3B or something, an IBM Unix-based machine. [Ed. Note: The 3B series computers were a line of minicomputers that were produced by AT&T Computer Systems' Western Electric subsidiary for use with the company's UNIX operating system]

Mostly we ran under DOS. Then at some point, it was again John's idea. I don't know if this was IL-13 or later, but he pointed out the future is Windows. We need to forget about all these other useless devices and do everything on Windows. But this must have been later.

Drake: I think so. Well, I think we had had our first financial reporting period in which we didn't break all records for income and profitability, and that was of course a big worry. I don't think we ever had a losing quarter, but in any case, it wasn't there.

Change in CEO

Drake: Anyway, there was a big debate over the management. That's all I can say. What came of that was that we set up a search committee on the board of directors and started a formal search for a replacement CEO. I can talk about that process from inside if anyone wants.

House: Was that when you brought in Carol Bartz?

Lutz: Yes.

Drake: That is. Yes, that's when.

House: Why don't you do that sort of quickly.

Drake: It's very hard to make it brief, but I will. One of my great insights in management is if you have to replace the CEO and you have to go to a headhunting firm to fill it, then you have failed in one of the duties in management. I think that's in some management books, but I got that feeling. We didn't really have anybody, so we got Heidrick and Struggles, an amazing name to me because the name Heidrick is associated with struggles in my mind. An auspicious name. Anyway, they did the search for us. They came up basically with three people, and one of them looked good but got away and we had three people. I will talk about those people. and I'll try to keep it short.

To put it short, each of the first two I had reasons that I didn't want and I was largely instrumental in their not getting the job. One of them I may mention wound up in jail for cooking a company's books a few years later. The company is a major, well-known database company.

House: You're not talking about Phil White?

Drake: Yes, Phil White, that's right. I talked the board committee into not hiring that guy because I disliked his ideas about management. I did not know that three years later he'd be in jail. The second was another notable Silicon Valley guy who I guess can be named at this time: it was Del Yocam of Apple. He was tired of being a number two man and wanted to be a number one man. And I have to reserve for another time my description of that meeting, but I wound up again saying, “No, he does not know how to manage the technical operation. Even if he shows the movie as a farewell party in which everyone sentimentally loved him, he would not manage our technical department.” The third was a very, very bright woman manager, Carol Bartz, of whom I knew nothing in particular. I was not satisfied with her from very, very early on in her tenure. Anyway, I bear some responsibility for the choice of her.

Lutz: Well, I do, too, by the way. I was a real proponent of hers. I think I could fairly say I was snowed. There haven't been many times in my life when somebody has really impressed me with a thorough snow job. That made a difference, because I pushed for her hire and ended up not so proud of myself for that.

Drake: Right. I remember an incident in her place when she was having garden work done with bulldozers. At her place, —there was an interruption. She was in the middle of saying something and somebody was *off of the refrigerator* (can this be right? Check the audio tape) and she interrupted herself and said, "Blah, blah, blah," talked to them for a moment and then went back into mid-sentence in what she was saying. I knew that there was a brain there who could handle two things at once. That's one management feature, and I was impressed.

Other Key Players and Artifacts

House: Well, this is all fascinating. We're kind of down on time, so let me just pose a couple of things here. We could go on for hours, and I appreciate that you've all been so candid and forthcoming here. It's a great interview and a great panel. I wanted to just say to get a rounded capture of Autodesk for the history buffs, who else should we talk to? I think I've heard Mike Ford and maybe some others.

Kurland: I think it would be great to talk to Scott Heath, who was the one who single handedly converted AutoCAD from 2D to 3D.

House: Thank you for that. You've obviously got some artifacts. Duff, you held up the floppy disk, and you had the picture of that. Has the Computer History Museum got any of these artifacts that you know of?

Kurland: Not that I know of.

Kalish: I don't think so.

House: I'd encourage you to at least think about going through your garage. If there's stuff that makes sense, in the attic or wherever at least think about giving that to the Museum.

Kurland: I can send you a link to the webpage that I've got with the jumping founders' photograph. If you mouse over, it'll show you who's who.

House: Okay.

Drake: There's another source I mention because the corporation is no longer ashamed of its origins. I considered that it was for several years. But I'm sure that if the Computer History Museum talks to them, you could wangle some interesting contributions out of them. As I say, I know that they have a nice list up to date of all the known releases of AutoCAD and I think it's thoroughly accurate because of course it's based on the earlier work that so many of us did. Anyway, there is just something I would ask for because there's a guy there who knows a lot, who has specialized a lot in the history. As I say, I don't remember his name. [editor's note: Shaan Hurley is the person]

House: Okay, I appreciate that.

Kurland: There's another incident in a different time period that should be discussed at some point, and that's the whole hardware lock.

Lutz: Oh, yes, that's a whole story, but it's pretty well covered I think in an Information Letter by John.

AutoCAD Compatibility

House: I think I'd agree with that. Just kind of to wrap up here, what in your opinion were the best decisions of those first six years? I'll ask each of you individually. What were the best and what were the worst? One each. Which kid is your favorite kid?

Drake: I'll start with one since nobody else is popping up. There's an anecdote attached to this. There are one or two market analysts in the business. We talked, of course, to a lot to analysts and industry analysts and there was one who actually knew something about the matter, Charles Foundyller. I learned a few things from him. He spoke and asked what advantages we had, and I said we had a technical advantage that we were set up to and managed to run on pretty much every machine that could possibly run this program and had open links to send the data in and out. The guy said that's not a technical decision, that's a marketing decision. I thought he was right. That's what a good marketing department would have told us to do, but we did it because that's what we believed in. That's certainly one of the best decisions we made.

Kurland: I would say, yes.

Lutz: A related very good decision that was made around then and implemented again by John was to make the storage format of an AutoCAD drawing completely compatible from one system to another. In other words, you could just take the file that you made on an Apple and put it on a DOS machine, and it just worked.

House: Yes, I think small architecture firms found that invaluable because it allowed them flexibility with their own computer needs. Not everybody did that.

Lutz: Right.

Technical Management

Kurland: I'd say the lack of red tape and management layers, at least in the early days, was a real benefit. As I mentioned in one of my emails, besides doing coding, I wrote the user manuals. If I found it difficult to explain something in the user manual, I could just go right in and change the code.

Kalish: Nobody else brought this up, but the addition of LISP that allowed third-party developers to really layer on top of the system, I think was really important. That was John's doing I believe entirely.

House: Sounds like John was a pretty key guy all the way through.

Lutz: Yes, you might say that.

House: Yes. You all had to consider yourselves incredibly fortunate.

Lutz: Yes. Bad decisions, I'm sitting here trying to think of bad decisions the company made, and I'm having a hard time.

House: We don't have to have any. It worked, and you guys did well, and you had a good time doing it. It's one of those fortuitous times in history that things worked, and I appreciate your sharing today so much of this. It's our privilege to have this time with you all. What haven't I asked that you feel compelled to tell us?

Drake: Well, I'll give you two gems from the wisdom of the glorious leader. At one time, when the company was well established, but not yet a big deal, it was in the old conference room at the place over the real estate office or whatever it was. We were sitting around and there was a discussion going on, a free discussion among the techies and related departments. One thing and another, it was kind of getting gassy and not going anywhere. John said in an aside to me, "One of these days we'll start our own company and do things right."

Another of his was our great management technique, that was management by lack of alternatives. There was a particular point where we had a potential goldmine going; it was when we had introduced the product and were wondering what direction it would go but still had other projects going on. Actually, it was Mike Ford who said we felt like people who were surrounded by gold coins and we couldn't shovel them up fast enough. I think it was at that monthly company meeting that we decided to cast aside pretty much everything else we were doing and put everything on Autodesk, which was a good decision, incidentally. That kind of thing gave rise to John's management by lack of alternatives because we didn't have the room to pursue any side issues.

Autodesk Marketing

House: A couple small things. Who ran your trade shows? How did those get done? Was that Mike Ford?

Drake: Yes. I think we signed up for Comdex the first time because John got a flyer and there was a reasonable rate in it. He decided we ought to do it rather unilaterally, which did not go over well with everyone. But I had faith in his judgment, so we did that. It was a common effort because you've heard what we did. Then after that, of course, we had an actual marketing department. That took it over, although we still sent real living, breathing programmers to work the floor and to answer questions and things.

House: Oh, yes. I would think. In the office space, you think of names like Jonathan Seybold as one of the analysts. Was there an industry guru for the CAD world that touted you guys? Or did this just grow organically?

Drake: Oh, there was. I'm embarrassed I can't remember the name of the guy who gave me the brilliant lesson in marketing. It was one of the smart analysts who understood what we were doing. There were a couple of them. [Drake note: The name was Charles Foundyller], He was a South African guy who taught me the lesson in what marketing is. We talked with various analysts, but again, people like me handled most of that management crap, and I don't think we bothered the workers very much with that kind of interruption. We had very little respect for any of the analysts, the financial or industry.

House: We're gathering that. Listen, I just want to thank you all very much for this time. We'll get a transcript out to you in due course. I wouldn't hold your breath, but you know, we're all so young, and it will all work out well. Thanks so much, and we'll be in touch.

Kalish: Thank you.

Lutz: Good talking with you.

House: Okay. Goodbye.

END OF THE INTERVIEW

