



Minicomputer Software Workshop: Starting HP Software Businesses

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Table of Contents

FUNDING THE BUSINESS START UPS	5
INTEREX	9
HP AND THE COMMERCIAL MARKET	11
INDUSTRY SPECIALIZATION	15
MARKETING AND SALES.....	19
HARDWARE SALES AND PROFIT MARGINS	22
SERVICES TO SUPPORT THE PRODUCTS	26
RESELLING SOFTWARE.....	29
SELECTING HP COMPUTERS.....	31
HP COMPUTER PERFORMANCE.....	34
PORTING TO OTHER PLATFORMS	36
COMPANY SIZE	38

Minicomputer Software Workshop:

Starting HP Software Businesses

Conducted by Software Industry SIG – Oral History Project

Abstract: Representatives of many HP software companies and representatives from HP discuss a wide range of subjects related to founding and funding their companies. They discuss the various systems and applications programs that they designed and built. They talk about why they chose to use HP computers and their relationships with HP. There is some discussion of the size of the companies and the effectiveness of remaining small. And there was an extensive discussion about INTEREX which became both a technological interchange as well as a marketing vehicle for the software companies. There are also comments about the HP hardware and the HP systems software and porting some of the HP products to other platforms.

Participants:

<u>Name</u>	<u>Affiliation</u>
Burt Grad	Moderator
Rick Bergquist	American Management Systems
Marty Browne	ASK Computers
Steve Cooper	American Management Systems
Steve Dennis	Smith, Dennis and Gaylord
Jack Damm	Palo Alto Group, Quasar and Cognos
Grace Gentry	Gentry Inc.
Martin Gorfinkel	Lark Computing
Chuck House	HP
Mark Klein	Abacus and Urban Software
Doug Mecham	INTEREX
Bruce Ray	Wild Hare Computing
Alfredo Rego	Adager
Phil Sakakihara	HP
Ron Seybold	HP, 3000 Newswire
Stan Sieler	HP, Allegro

Harper Thorpe	HP
Fred White	HP, Adager
Rene Woc	Adager
Doug Jerger	Software Industry SIG
Michael Adamson	Historian
Gerard Alberts	Historian
Glen Bugos	Historian
Michael Mahoney	Historian

Burt Grad: We have many different companies here and we want to cover both business and technical issues. So instead of each company giving its own detailed history, we're going to discuss some of the major issues of starting a new company: what were the technical issues, what were the business issues, and what were the staffing and management issues. That way we can get all of you to contribute so we know who you are and we know your companies.

How many of you were self-funded, and took no outside money to make it happen? [Show of hands]. Ten of you. Turn it the other way, which companies had to get outside money? [Show of hands: None.] At any point in your existence, did you need outside funding, any of you? Bruce Ray did for his company. I didn't introduce Bruce from Wild Hare Computing. He is heavily involved in collecting Data General artifacts of all kinds, as well as running a business for 30 years. Bruce was also in our DEC/DG session on Tuesday. Thank you for joining us Bruce.

Bruce Ray: I'm glad to be here.

Grad: Rick Bergquist, we didn't really give you a chance to say hello and to tell us what you do.

Rick Bergquist: I got involved with the HP 3000 when I joined American Management Systems. I worked with Steve Cooper. I was an early technical programmer working on a business system for Weyerhaeuser. I wrote a number of intermediate tools for developing applications on that system. We wrote our own foundation layer, and I programmed that. And the other piece I ended up dealing with was the Image database. Every application system, when you go to run it, it never runs fast enough. So they said 'why?', and then I developed the program called DB Loading, which Steve tells me is still running, which surprises me.

Grad: Did you stay at American Management Systems?

Bergquist: I worked on the HP 3000 for a number of projects, and then moved on to a different organization within AMS.

Grad: When Steve Cooper left, you stayed on?

Bergquist: I was there in a different division.

Grad: Bruce, what kind of things did you produce? Was it for the HP 3000 primarily or for other platforms?

Ray: It was for the HP 3000.

Funding the Business Start Ups

Grad: Okay. So let's go back to the funding issue. In some of the cases, I gather that you were individuals while in other cases they were partnerships. I'd like to have some of you tell stories about why you got into the business. What got you started? Why did you feel there was an opportunity?

Steve Cooper: Well, I came from Allegro. At AMS we were the first regional office, and as time went on, the company grew. The company headquarters were in Arlington, Virginia and we had offices around the world. The company grew but not in the HP 3000 direction. Our HP business was very much what Rick and I had been doing on the west coast. I think we got to the point where the company made a dart to the right, and we wanted to keep going straight. It looked to me like the best way to do that was to leave and start our own company. And to continue doing the kinds of things that we were doing at AMS. That's where I got together with a colleague of mine, Stan Sieler, and then we started Allegro. In fact, AMS was one of our biggest clients.

Grad: So the two of you got together, self-funded, setup an office, and went into business. Other stories?

Jack Damm: I supported myself going to business school by doing contract programming. And when I became a graduate, I had job offers from consulting firms. I got pretty nice job offers, but I'm kind of an independent guy.

Marty Browne: Oh really?

Doug Mecham: New information always shows up.

Damm: I turned down McKinsey, Arthur Anderson, and a couple of more companies. I'm kind of glad I didn't move to Arthur Anderson. So I went to work for myself, which was a terrific idea in 1970. I had fellow classmates who were doing business plans for people trying to raise money. I'm a numbers guy, so I did all of the numbers by hand, and that was my inspiration for writing the spreadsheet. I supported myself by doing consulting work and contract programming with a lot of help. HP was a big customer of mine in those days.

Grad: Grace Gentry has mentioned that they were in the services business but moved into the HP software arena.

Grace Gentry: Well, yes. When we looked at the minicomputer we said, "This is the wave of the future." The idea was simply to get our stripes so we could consult on the computers coming up. Then Warner Earhart wanted us to develop, I think, 200 reports for them. It was clear to us that they would be changing these reports constantly, so we wrote a contract with them wherein we would develop a report writer called REX, Report Expeditor. We would use it to generate these 200 reports. This would end up as a product and we would have the right to market the product. And so that was how we got into the product business.

Grad: That was a smart move. Any of the others do that kind of thing where you had somebody pay for the work you gave them a right to use, and then you kept it as a product?

Steve Dennis: Yes, we did that quite a bit in the early days.

Grad: Examples?

Dennis: When we got into the healthcare field we agreed to write software using the customer as a real world laboratory in exchange for us having the rights, worldwide rights, to marketing and selling. But back to your original question, how we got started. I was with GE Information Services. I come out here [California], from Maryland. I took Sandy Kurtzig's slot. My biggest client was Intel. They were using GE timesharing to do all of the software for the 4004. And I realized that software was where the business was headed. So I wrote a business plan, took it back to GE in Maryland, and said, "We need to get into the software industry." And they said, "No, software is really for selling iron or for selling time." And I said, "I don't think it's going that way in the future." So I came back and I told my wife, "I'm going to start my own company." That's how I basically got started. We were self-funded by client revenue. I mean we just were "have gun, will travel."

Grad: You said self-funded. You got enough money out of consulting work then, not out of products?

Dennis: Both. Well, out of consulting work that turned into products, and we productized almost everything that we did. So we would do custom work, but we always, in our contracts kept the rights to reuse the software.

Grad: Which others of you had that same kind of approach?

Browne: Yes, I think that our experience at ASK was a direct corollary. We built up the business based on getting consulting contracts, building product, reusing that product to resell it. It was self-funded and bootstrapped.

Grad: Did a lot of your enhancements and improvements come that same way or just your initial work?

Browne: All enhancements and improvements to the product came directly from customers, not some. Every one of them.

Dennis: Yes, the same with us.

Grad: Which others of you did that same sort of thing?

Damm: Just to put my Quasar Systems hat on for a second, Quasar had a contract, I think it was with the Canadian government, it might have been the Bureau of Prisons, whatever it's called in Canada, in Yellow Knife, which is not a place where there's a lot of entertainment. And Quiz, the first product in the Powerhouse series, was built as a part of that project, and eventually went on to be a major source of revenue for the company. Cognos, when I joined it, was a \$15 million a year consulting business, with a \$3.7 million a year software business. That percentage changed considerably over the years.

Mark Klein: Abacus was primarily a development and consulting house as well, and we realized pretty quickly that being able to take the products and relicense them was something that we wanted to get into as well. And the Recovery 3000 product came from the Oakland A's baseball club. They needed Recovery and they funded us. And we were able to turn around and license that separately.

Gentry: What year did you that?

Klein: Around 1978.

Gentry: We wrote all of the original HP 3000 software for the Oakland As. We did their order entry, their ticketing, et cetera.

Klein: Most of the software that Abacus ultimately turned around and sold was developed that way.

Grad: Alfredo, do you care to comment?

Alfredo Rego: Yes, well, I have a slightly different experience from most people here, some of whom have MBAs and business experience. I had none whatsoever. I was a university professor in Guatemala and Rene [Woc] and his friends used to represent HP in Guatemala. They asked me to do some consulting for them. And as part of this relationship, I started a project with my students about how to transform Image databases. So, there was a conference in Denver, at the beginning of November of 1978. I went to give my paper and I didn't realize that this function had not really been done before. I met Steve Cooper and Bob Green who should be here but is not.

Rego: Now, I was supposed to leave the university for just one week, but Bob invited me to go to Vancouver so I went to Vancouver. Then I went back to HP to see Fred White. But I had no money whatsoever, zero. So I remember that Steve and the AMS guys invited me to have Thanksgiving with them. I even packed up some food so I was able to eat on the weekend, so that was great. I'm forever grateful. And then I went back to Vancouver and Rick Bergquist, I remember you were doing some work at Weyerhaeuser in Tacoma. So I took the bus from Vancouver, and I don't know if I stayed in your room or what. So it was all done totally informally with no financing whatsoever.

Damm: I can remember people saying, "Oh that guy, Alfredo, he came in and fixed our database, and slept on our sofa."

Grad: Rene, can I ask you a question? Were you in business at that point in time, or not?

Rene Woc: With a group of friends that I had met upon my return from school in the States, we formed the company to distribute HP products. This group of friends, among other things, had an HP 2116 and they were doing structural calculations. We figured, well, there's an opportunity in that. And some of them were very aggressive marketers and IBM was selling all of these System/3s. There was a huge opportunity for us there so we started marketing, and actually got some fairly interesting contracts competing against IBM for multinationals like American British Tobacco and Philip Morris. We had sold a turnkey product. So there was this small matter of making it work. And that's when we linked with Alfredo and started working together. And then an HP 3000 catalog came out and we decided that we needed to get into one of those things. That was 1974. We had to go through an almost six-month process for HP to approve the sale. We actually got the second HP 3000 shipped to Latin America. We actually had to buy two of them so that they would agree to sell it to us.

Grad: Yes, being outside the United States it's a very different experience how you get going.

Woc: And so there was a lot of synergy, and we all were kind of cooperating and trying to get into the market. Especially with the numbers that we knew people were paying to buy IBM systems. So from our point of view, that was the opportunity.

Grad: Martin, how did you hook up with Mark Klein?

Martin Gorfinkel: Another guy and I got laid off. We had been working in programming, in my case a few months shy of 15 years, working on Burroughs equipment, and decided we were better off starting our own business. The HP salesman had an outfit close by that needed changes to the editor for their own work to do on an HP 3000. And so he worked a deal where he gave us source code for the editor so that I could make the changes, and arranged for them to give us free access to their 3000. And we worked over a leased line with the 3000 for probably four years. And out of that little bit of work for them developed the word processing software later.

Grad: Was your primary income from the word processor product or from consulting services?

Gorfinkel: Probably the first year the company that sacked us had the poor foresight to not have documented the work we had done there before they got rid of us. So they basically paid our expenses in return for documentation of the programs that, in fact, didn't belong to them either, but that they needed documented. So that kept us going for the first year. And then the word processing kept us after that.

Grad: Doug, you had a comment?

INTEREX

Mecham: Yes. What I find very interesting - and this is probably true with all of the vendors - from the very first meeting we actually produced a tape of software contributions. And from that grew a tremendous amount of software through Wayne Holt at Whitman College that was used everywhere. Did anybody here not use a program model from the software library? And some of them were very good with some early editors and all kinds of stuff.

Grad: These were all free programs that were available?

Mecham: Free programs which, in essence, indirectly supported the users group because then people came to meetings to take home the library. So our funding was primarily through the users coming to the meetings supporting the conferences and things.

Grad: Was INTEREX “owned” by HP?

Mecham: No, we have been independent from day one. And we have never received direct funds. But, we received some money indirectly since HP bought space. They’d also buy us lunches once in a while.

Grad: Was INTEREX a corporation, a for-profit, or a not-for-profit?

Mecham: Initially it was just an ad hoc group. It was incorporated by Bill Briden in the early 1970s as HP 3000 General Systems Users Group, I believe, at the time.

Grad: Was it a not-for-profit, or was it a regular corporation?

Mecham: It was a not-for-profit at that point in time. Yes. It has never been for profit.

Grad: Really?

Mecham: It’s been totally for the advocacy of Hewlett-Packard computers, initially the HP 3000. Later on it expanded. But it was primarily to facilitate the users coming together: it held conferences. We had special committees. For instance, one committee, the technical group headed by Ross Scroggs, would meet quarterly with the HP research people and sit down and work out what the users wanted. It was phenomenal collaboration.

Grad: So your funding then came from the people who were at your conferences and from buying space, and tables and things like that.

Mecham: Exactly.

Gorfinkel: And people bought memberships.

Cooper: I just wanted to say, I know we’re drifting a little bit, but that the November 1978 meeting that Alfredo referred to in Denver was a life changing experience for us. I was there with Rick [Bergquist]. And we were, as I mentioned, earlier fighting with bugs in the MPE operating system, and Image, and COBOL and trying to make the 3000 work. And what a shock it was to find that, hey, there’s another 1000 people all having the same problems that we were having. And that’s when we divided and conquered. Rick went to one session and he

came back and said you've got to hear this crazy guy from somewhere in Latin America that's got the nerve to write privilege-mode code; and by demand Alfredo had to give a second talk. That's where I met Alfredo. I also met Bob Green. I met many of who are still my close set of contacts all of these years.

Grad: That's a very fascinating thing because those of us in the mainframe area were involved with a trade association called ADAPSO and almost all of the significant software companies were members there, and they educated themselves and taught each other. And there was a thing called the ICP Directory by published by Larry Welke and that was the advertising vehicle to get the DP managers to know about the products. It sounds like INTEREX served very much that kind of role.

Cooper: Well, right after that, we learned about sharing and the contributor library. We learned about the power of advocacy working together to go up against HP. All of that happened in that very first meeting.

Damm: Yes, I had occasion to do some of the DEC shows during my years at Quasar and Cognos. And it was an amazing contrast between Decus and INTEREX because Decus was actually quite adversarial to commercial interests and INTEREX was not. Very, very different.

HP and the Commercial Market

Grad: Let me ask a question before you go ahead. Any one of you from HP, Phil or Chuck or anyone, how aware were you of what was going on at INTEREX? How involved were you? Were you in favor of it, against it? Or didn't give a damn? Phil, any thoughts?

Phil Sakakihara: We were in favor of it because, I think, it added a lot of value. And our goals were to increase revenue and the added value of the software that was provided by these folks really drew a lot more revenue in.

Grad: Let me play devil's advocate. You were doing some application programs, you did the manufacturing application program at HP. Sandy [Kurtzig] and Marty [Browne] were directly competing with you. Didn't that get you upset? Chuck?

Chuck House: You need to understand some things here. Ari [Kurtzig] ran one of the significant labs at HP so it wasn't that we were mad at Sandy and loved Ari. It was that it was all part of the family.

Grad: But she was competing with you.

House: No, no, no, we didn't have anything like ManMan for a number of years. It was much later that we competed. But I want to make a point that has to do with the difference between ADAPSO and INTEREX. These people were all building stuff where HP gear didn't work. I don't want to say it quite that way, but this stuff was pretty primitive stuff. And we were building drivers and connectors and trying to figure out what got left out of the manual and what people didn't know. And it was an engineering group. It wasn't an IT directors group. And the ADAPSO group was the guys who were buying big iron in the back office and they got together about strategy of how to buy multimillion dollar machines.

Grad: No. ADAPSO was all people who were producing software or services. It had no users. I gather INTEREX was a user's group at which you all as vendors had an audience and could get together. Is that it? Am I understanding it correctly? I mean users, the customers were there and you had access to them through that link. ADAPSO, absolutely not, there were no customers there, per se. It just was the developers.

Stan Sieler: Even though we were vendors, we were users there. And a lot of the vendors there interacted just like other users.

Grad: That's a meaningful difference. Stan, the difference is that that was the way you did it. You were together. You weren't just displays there. You were part of the organization. Do I understand that correctly?

Damm: Yes, it was a collaborative community; I think that is the way to think about it. And I think that what made it very positive was that collaboration.

Mecham: And in fact, many of the vendors would go solve problems of users, I mean a free-of-charge kind of thing. It was very much a collaborative group. And the contributions, I think, played a big role in our funding. For instance, I know Hughes Aircraft Company would send me up here to HP on troubleshooting or to a conference. My secretary at Hughes Aircraft Company produced a newsletter. This happened throughout many vendors, many companies, like Weyerhaeuser. They would contribute time and money for people to make this thing work. In fact, Ross Scroggs, who supported the HP editor, when he left HP maintained that editorship for over a year from the outside.

Browne: I hope I don't insult anyone. If you look at the history of HP computing, go back to the HP 2100, the HP 1000, then there's the HP 250, and then there's HP 3000. None of those four computers worked to provide or to create commercial applications. You could not create a commercial application to build the bill of materials, to do an MRP, to do an accounting system. You couldn't use any of those computers to do anything particularly useful from a manufacturing standpoint.

Grad: That's a different question than Chuck was raising, though. I thought there were systems issues that the systems products in some ways wouldn't work. Applications are always a different dimension, aren't they?

House: No, no. He's making exactly the same point. It's that these things were primitive components and didn't have the glue to make them into anything on which an application could run unless you could build the underlying drivers. So an awful lot of this was just how do you do something, and it wasn't like the Internet where you could just go ask. So this group shared the knowledge that everybody had learned that hard way. Am I pretty much on target?

Grad: Was HP a member of the group?

House: Sure.

Mecham: Absolutely. And then they used to send SEs to Hughes Aircraft Company so I could train them. It was interesting because many users knew more than the SEs and they'd share their knowledge with them. And the SEs, in turn, would turnaround and help other users. In the early days, there wasn't a driver for a router device like Versatec, so I wrote the driver.

Gorfinkel: I wanted to back up a little bit. Before the HP 3000 I was involved with the Burroughs computers, and the Burroughs user group worked very much the same way.

Sieler: Yes. That's what I was going to say.

Gorfinkel: It was adversarial with Burroughs. They were cooperative, but at a distance and feisty. It was very much on the same model. At the early meetings of the user group were all the technical working people. In later years, shortly before it crashed, there was a shift and data processing managers and top management were coming to the meetings, and the tone, to my ear anyway, shifted from being a technical get together to being a party-line sales pitch and totally not useful.

Harper Thorpe: Yes, I was just going to add, in these early days, there was no ecosystem around the products that HP was bringing to market. We were primarily a hardware manufacturer with operating systems, pieces and parts that rode on top of that. The original impetus, I think, was to control instruments that HP manufactured, and then to do the measurement work that Chuck was mentioning. So when we got into commercial applications, we basically didn't know what that was about. We knew who our competitor was and we had to replace an IBM or a Burroughs or whoever it was. We were going to go into an IT department, who had expertise, who was willing to take on the challenge of making their applications work on an HP 3000 or 1000. Or we brought one of our friends who, in many cases, were consultants before they had products, which is the story you've already heard, and they were

there to help us deliver a solution to a customer's problem that we might not yet understand but we hoped they did.

Grad: Was it a conscious decision on HP's part to go into the commercial businesses? Or did these people sort of lead you into it?

Thorpe: We were brought into it by some of our partners who actually saw the opportunity based on what we were bringing to market. And there was an opportunity there relative to what the competition was offering. And so these early beginnings were the tool sets and the REX's of the world, and those things that would allow applications to be built on top of fairly primitive operating environments.

Grad: Let's pursue that one step further. DEC and DG by the mid 1970s were moving into the applications world outside of the straight engineering applications. Was that a factor to you at HP?

Thorpe: I don't know that we saw them leading us there. I think to a great degree our partners helped us go there because they had those experiences, because they knew those opportunities existed and we went hand-in-hand. You couldn't have called HP, at that point in time, a solutions provider. You show up in front of a customer and say, "Would you like to buy a computer?" They'd say "What?"

Mecham: What was very interesting, one of the first big applications written on the 3000 was written in FORTRAN because it had character capability. It was a financial package by the National Bank of Detroit and it worked very well. That came very early in the 1970s. I will never forget being at a user's group, board director's meeting at HP. Paul Ely was there, and somebody, I think, it was Gerald Schwartz, said, "Well, you're in competition with IBM." And Paul Ely went ballistic. Slammed his fist on the book and said, "We are not in competition with IBM." And of course, we all chuckled because you really were in reality. It was one of the funniest moments I've ever come across.

Grad: One of the stories I've heard about FORTRAN accounting applications, is that it never came out to exactly \$1. It was 0.99999. I think Bob Patrick once told me that story.

Dennis: The U.S. government is still using that process.

House: That's right. And these are going away pretty soon. You asked, "Was it a conscious decision on the part of HP?" I think it's worth setting the record straight a little more here. Bill [Hewlett] and Dave [Packard] didn't want to go into computing for a very long time. And they owned the company, they ran the company. It was a public company, of course, but they had 50-plus percent of the stock. And when Packard left for the Defense Department, we

had just introduced the 9100. We didn't know that it was going to be successful. Wang had introduced a product like it nine months prior. We took seven orders in nine months. And they thought enough of that to write it up in their annual report: that this is a blockbuster with seven orders. So you need to appreciate the point in time that this stuff was happening. When Hewlett became president, Tom Perkins had just taken over the computer division for the 2100 family. And he took an order for Holiday Inn to do a reservation system. Hewlett ordered that sale voided after they got it and we all got ready to do the work. So the stuff came back. He got rid of Perkins. And then he fell in love with this damn 9100 and built the handheld calculator. Stanford Research Institute issued a market report that said it would never sell. Hewlett got his dander up and said, I'm going to go ahead with that, and I don't know about this thing called Omega. I'm going to cancel it. But I'm willing to let these kids keep going on what became Alpha. Packard came back, asked the kid that started the program on the 2100, Roy Clay, to get HP out of computing. Roy walked out of his office. They didn't speak for five years. A month later, we introduced the 3000 and Dave was ballistic about the fact that it even got introduced. And then he pulled it off the market three months later, when it didn't work at Berkeley. So there wasn't this strategic intent.

Grad: That's exactly my question. Was there a strategy? Was there a plan? Was there a direction that was being set on purpose? Or did these things sort of evolve? Because in different companies, we find very different patterns in this regard.

Mecham: Because Hughes Aircraft Company was technical and we bought it for technical reasons because it was for engineering. But it was interesting that the 3000 came out as an engineering machine but it had a 16-bit integer register. Do you know how long it took my engineers to overrun the 16-bit integer register? About three nanoseconds.

Industry Specialization

Grad: Now, those of you who have had systems types products, you sold to anybody who was buying the machines. Is that essentially correct or no? Anybody with systems products have a different feeling?

Sieler: We would sell to anyone.

Grad: You weren't industry dependent. Harper talks about the verticalization later on and some of you speak about working in the health areas and manufacturing areas. Was there a lot of industry specialization going on or was that unusual?

Dennis: Yes, but for us when you had more than one client in an industry you became industry specific. It wasn't as much that we were sitting there in all of our wisdom like maybe

ASK and said we should be in this industry. It was like, "Wow, we got three clients, we're in this industry." And the news just had to multiply it.

Grad: "Oh, we got there here, now we can do something there."

Dennis: Right. It was another way to bootstrap.

Grad: Tell me about the ASK thing. How did they become specific to the manufacturing industry?

Sieler: Well, we fell into it much like Steve did. The first clients that Sandy had were actually circulation and accounting departments in newspapers. She had a contract with a GE division that did some manufacturing. She had a rudimentary understanding of bills of material. You needed a computer to manage bills of material. The first contracts she got once she came out here with Ari was with a manufacturing company called Feron Microwave to computerize the bills of material and so we computerized the bills of material. And we invented MRP and other people fell into line saying, "Well, that's a good thing. We want one of those too."

Grad: Where did the technical knowledge come from of the manufacturing area?

Browne: Most of that technical knowledge came from me working at a manufacturing company.

Grad: You had worked there before.

Browne: I worked with Sandy for several years at a manufacturing company putting their systems together, understanding what bills were, understanding work orders, understanding purchase orders, understanding inventory control.

Grad: What systems were you working on there?

Browne: They were not systems. It was a bill of material that was handwritten and maybe it got put on punch cards and updated every six months, but it was all manual. This was 1972. You know in the 1970s, most of the systems that we sold were to people who were using manual systems. They weren't using computers.

Grad: I come from a different background in working with both GE in the 1950s, and then at IBM. We were upgrading from punch card systems to computer systems.

Browne: I'm saying 90 percent of the clients that we had from 1972 through 1982 had not had any computer experience.

Grad: Let me ask a question for all of you there, is that because the size and price of these machines opened up a market that was completely different from the data processing market that we had been looking at?

Gentry: Yes.

Grad: All of you are nodding your heads on that.

Mecham: The first systems in the user group forum, two were hospitals. One was PROMON in Brazil, which was a paper company. They were not engineering companies, oddly enough. They bought them because of this technology.

Gentry: Well, because they could afford it for the first time.

Grad: So certainly the price. How about the ease of use? Was it better? I'm getting a mixed feeling. In IBM when we were doing the System/3, our focus was to make it easy, the report generators, very simple things to write the reports and do things. I don't get that same sense.

Browne: IBM was ahead of us in the HP world.

Damm: There was a more committed group, though, of people who understood the HP 3000 because I tinkered in the IBM world. What I was going to say is that, Marty, I followed you guys into a lot of companies that would buy a manufacturing system when they got the original funding for their companies.

Browne: Yes.

Damm: It was astounding to me that these people had a manufacturing system. I remember one in particular. They never did get their prototype to work.

Browne: All of the disk drive companies, all of the PC companies, there was a whole genre of VC-backed manufacturing companies that said you need manufacturing software, buy ASK.

Damm: Exactly.

Grad: Okay, let me ask that question. Silicon Valley, local, did that make a difference?

Browne: Huge.

Damm: Huge.

Gentry: Yes.

Grad: And you had all of these disk drive companies, all of these other people forming new companies and they were buying this kind of stuff.

Damm: You got it.

Gentry: That was kind of later.

Damm: They're great customers for a spreadsheet because they had to update their financial plans all of the time for the VCs who were funding them.

Browne: Yes.

House: This is part of why Silicon Valley is Silicon Valley.

Grad: In all of the time we've been working on collecting software history, I've never seen that kind of a local connection.

Dennis: It was really significant. I think it was true of ASK too; we had several HP 3000 computers that we called our nursery and it was basically for startup companies to bring their systems online in the service bureau environment. And then as soon as they were large enough they would buy an HP 3000 and we would move the software in house.

Browne: We called that ASK Net. We had the same thing.

Dennis: A huge number of clients that fit into that category.

Grad: How many of the rest of you did timesharing or service bureau type operations and then helped move the people? So that was a common practice, there's a half-a-dozen hands up. Stan, you had a comment.

Sieler: I was going to say, I think we're seeing a difference between vertical versus tools. At least, the two people I know could have been anywhere. They were anywhere. They

were in Guatemala. We happened to be in the Bay Area, but that was almost irrelevant because our customers were all around the world. We weren't depending on VCs. We came in after the sale was made, in effect. And it was the users group that was more important for us than anything else in terms of word-of-mouth advertising.

Cooper: I just wanted to make a comment on the industries because Rick and I worked in different ones, and I thought it was fascinating to see the difference. We started working in Weyerhaeuser, in the forest products industry; they are planting trees for us now that 80 years from now they'll know if it was a success or not. And you go to an industry meeting with all of the different forest product companies, and they all know each other and they're good friends and very open. From there, we went into the high tech stuff here in the Valley. I remember going into Memorex, for instance, and having your briefcase searched at the desk. And where you can go to Boise Cascade and say, "We did a project for Weyerhaeuser," and they welcome you with open arms. But you go into Memorex, and you say, "I did a project for Fairchild," and now all of a sudden they don't want to talk to you anymore.

Marketing and Sales

Grad: Let's talk a little bit about marketing and sales.

Gentry: We were HP OEMs and we worked with the HP sales people who actually found the leads. They would go in and try to sell an HP system and when they discovered that the customer had never had a computer before and didn't just need the hardware but they needed the software, needed the handholding, needed the training, et cetera, then they would turn to an OEM company. And we had a combination of packages that we had developed, our own report writing, et cetera, and then HP would come to us and take us in. So not only were most of our customers companies that were buying a computer for the first time, but I think all of them were. And we kept telling HP, "You can take us anywhere. We can do anything." They couldn't seem to relate to that. So finally, we did a couple of order entry systems in a row, and we said, okay, we're order entry experts. And then, every time order entry would come up on the screen, they'd take us in. But HP sold for a lot of us, didn't they? Didn't you get sales because of the HP sales team? .

Grad: Let me talk about that. How many of you have stories about using HP as your lead generator? One, two, three, four. How many generated your own leads, basically? The same hands. I said of the nine, four of them raised their hands both times. How did you sell your product? Who did you sell it too? How did you find your clients?

Gentry: They're not sure.

Klein: I'll switch from my direct sales hat to the Orbit hat. And maybe Stan can comment on some of the earlier INTEREX meetings that he attended that I didn't. Most of the lead generation for Orbit was through INTEREX and through people finding out that they didn't have a large enough window in which to back up their computers. And Jorg Grossler realized that he needed to do something to improve performance, keep the machine available, and he developed the online backup technologies both on the classic and later on the RISC machines. But all of the lead generation originally was through the user groups, both here and in Europe, and it ultimately became word-of-mouth.

Gentry: Yes. And a company such as ours would send our customers to different software tool companies when we saw they had a problem that the best solution, the cheapest solution was a package and not more custom development. Martin, how did you get your clients?

Gorfinkel: Mostly through HP salesmen. And the impression I got was that somebody would issue a Request For Proposals (RFP) because they wanted a computer. South Dakota was one. They needed a computer and the RFP landed at HP. One of the requirements was that it be able to deal with word processing. And in their case, they needed real time word processing. It's the only application like that that I've heard of where the governor gave the state of the state speech off the cuff. His secretary listened to it on a wire, and used our software to type it up so that they could distribute printed copies by the time the reporters returned from the legislature back to the governor's office. But that was just HP turned it up, and we beat out Wang and one other dedicated word processing system for the job.

Grad: You're opening another door I want to look at. Obviously, INTEREX didn't work as a marketing vehicle unless the customer already had the machines.

Gorfinkel: Right.

Grad: So I'm checking to see the difference between your making the sale by going to somebody who wasn't already an HP user versus once they had an HP machine. I don't have a good sense of that.

Gorfinkel: I don't understand why – both avenues worked.

Grad: Did you use both?

Gorfinkel: Yes.

Mecham: Many of the HP salesmen ran new users through the users' group conferences. So if you want to find about it, go to a conference. So the user's conference also served as a

vehicle. It was both. I mean in Mexico where I formed a Mexican users group, we had a big conference, there were like two HP SE's and nine HP 3000 users, and all of a sudden, vroom, we had over 100 people there. Ed McCracken suddenly realized, because he gave the key speech down there, that Mexico was a marketplace. And, in fact, he ordered a factory to be built down there, and he quadrupled the number of SE's just on the basis of that kind of an influence. So it was all kinds of ways. It wasn't any one way.

Rego: And Mark mentioned the United States and Europe. I know I attended user group meetings, basically, everywhere on all continents, and small islands. So it was truly international.

House: Yes, it had been from day one.

Dennis: Let me add a couple of things. First, we got a lot of our leads through the CPA firms, especially Arthur Young. And the leads that we used to get through HP were always couched in: "we have to bring at least three software vendors to the deal". So, often times we were in a situation where DEC and Data General were bringing in their software companies, and HP was bringing in three software companies so that's what led us into our own sales force that worked through a lot of the CPA firms until we matured, the industry matured and we all started to have our vertical niches, and then HP would bring us in for very specific vertical situations.

Grad: Yes, so you're bidding in multi-vendor situation.

Dennis: Multi-vendor and multiple software companies.

Grad: That's not a high reward process.

Dennis: Exactly.

Thorpe: I want to key in on a couple of things Steve has said. First of all, most of these companies from our perception were generalists until they had the second customer in the same vertical. While they were generalist, what they had to market might be suspect because primarily they were consultants or developers who were capable of doing anything, but there wasn't yet sort of a value proposition to go to market with. As soon as they had that vertical slice identified, and they had more than two customers that they could point to as references, from our perspective, they got more aggressive in marketing themselves. And certainly ASK was at the very top of the pyramid for us relative to a manufacturing solution. So I'm not sure who brought who into how many deals, but clearly, they had their own reputation to go to market with within a vertical.

Thorpe: If I could just add a couple of points to what was said. One of the things that distinguished HP from some of the other computer companies was we were really never in the application business. There were forays into the applications business, but our ISVs were part of our ecosystem and a necessary part. And, I think, HP generally speaking, although I'm sure there were bumps in the road, sort of gave that to our ISV partners, and said, "That's not our core competency. That's not where we're going." So there wasn't competition with HP from an application standpoint. There was an embrace, and we needed them to sell hardware.

Hardware Sales and Profit Margins

Grad: How many of you sold hardware along with your software? One, two, three. You were the only ones who were hardware sellers? The rest of you sold software only? The three of you, would you consider yourself a VAR? You used the term OEM.

Thorpe: Yes, OEM for us originally was any reseller. OEM eventually became somebody who was going to imbed our technology in their technology and then perhaps wrap a solution around it. We began to distinguish between OEMs and VARs. We typically resold our hardware with their application.

Damm: I have a question for those of you who have been VARs and that is that one of our concerns as straight software sellers was that you had margins on the hardware, which in the early days, I think, were very good. And correct me if I'm wrong, but over time, the margins got less generous. And so kind of the world changed a little bit as HP 3000s became more popular, HP didn't give away as much money to the VARs. And all of a sudden you really had to charge money for your software. We were concerned that the VARs were giving their software away to kick up the margin on the hardware.

Grad: We had a discussion of that at the DEC/DG meeting. A couple of the guys there were saying that essentially, they made all of their money on the spread on the hardware, and it didn't matter on the software price. They were going to get maintenance revenues on the software, so that was okay. But their initial sale, they were making nothing on the software. You didn't have that experience?

Gentry: No.

Dennis: No, I didn't have that experience at all. As a matter of fact, we made a conscious decision. I remember the board meeting where we said, "We are going to use our hardware margins strictly for R&D." So we used every dollar of hardware margin and we set that as our R&D budget. We did all of our software development using those margins.

Grad: Of your total sales, what percentage in your case, Steve, included the hardware versus didn't have the hardware?

Dennis: What percentage of our sales included the hardware?

Grad: Yes. To what extent did you give turnkey delivery?

Dennis: Probably 50 percent.

Grad: Did ASK do much turnkey work?

Browne: We resold the hardware in virtually every situation both with Hewlett Packard and Digital. And the margins certainly did change. But we always sold the hardware, with an exception if the company we were selling to had a better agreement with HP and they could buy the hardware cheaper. But salesmen get compensated in a variety of different ways. If I'm not mistaken ASK was the largest company among all of the companies here in terms of the number of employees and the amount of sales, 2000 people, about \$100 million. It may be that Cognos got close to that.

Damm: It depends on what year.

Browne: Yes, but again, it's about \$100 million, 2000 people, at ASK. But we sold the hardware in virtually every case.

Grad: Okay. Let's talk numbers. What kind of discounts were you giving, 30 percent? Larger, smaller?

Thorpe: In the early days, it was volume based, typically, so the largest VARs got the deepest discounts and it probably ranged from, I'm going to say, 15 percent to 40 percent.

Grad: So that kind of a spread. What happened in later years?

Thorpe: Well, of course, competition was part of the issue. And I spoke of the schizophrenia earlier where we loved our resellers for a while, and then we wanted our resellers to be ISVs so that we could keep all of the hardware margin ourselves. And we went back and forth on that. By 1990 and beyond which is the era beyond what, for the most part, we're talking about here, we went away from a volume-based discount to more of a value-based discount and it was more uniform around 30 percent.

Grad: The biggest question is if ASK sold hardware, did the HP salesman on that account get any commission?

Thorpe: Our salesperson was commissioned on the HP content only.

Gentry: So hardware.

Grad: But it would be 30 percent less because the sales price was 30 percent less?

Thorpe: It would be the net of the transaction. So if ASK got, say 40 percent, they would be commissioned on the 60 percent of list price.

Grad: Did that upset them?

Thorpe: Our salespeople?

Grad: Yes.

Thorpe: No, because they couldn't make the sale without the partner.

Grad: They felt they were getting a free ride.

Thorpe: I wouldn't say they thought they were getting a free ride. I mean, again, the internal conversation always was, "Well, is the HP salesperson doing the work and dragging the business? And are we compensating and motivating them correctly versus the marriage with the partner?" But if you're selling to a manufacturing company who needs a manufacturing solution and you don't have your own, then it's zero of something or it's 60 percent of working with your partner.

Grad: Suppose they were going to sell 10 of these. They had a good size customer. They're going to buy five or 10 systems, would your seller try and take away the hardware sale?

Thorpe: Well, one of the gotcha's in the biggest accounts was many customers might demand that they deal with HP directly because they felt they would have that leverage in buying a volume of HP gear, in which case there might have been that give and take.

Grad: Did that ever happen?

Browne: I'm sure that happened, but we charged enough for our software to where the margins on the hardware were pretty insignificant.

Gentry: Were marginal.

Dennis: The margins were marginal!

Browne: I mean it really was. Our revenue from the portion of the HP hardware side was insignificant compared to our overall revenue.

Grad: Why did you bother selling the hardware?

Browne: Sandy ran the company.

Dennis: Plus the clients were demanding a turnkey system. They were looking to us as a solution provider. As the market changed and people were driven by the software, they were asking which software do I want, not necessarily what hardware? There's another key point I want to make, HP's healthcare operation was based in Massachusetts and the sales force was completely different. And so our interaction with the HP sales reps selling hardware on the healthcare side was completely different than it was selling it on the commercial side.

Cooper: I think Steve touched on an important point. The data center of 1970-something looked very different than the data center today. Today, you've got Cisco and HP and Sun and everybody else. You'd walk in there and you bought your terminals from HP, your cables from HP, all of your peripherals. It was basically an HP shop and a lot of customers wanted that one-stop shopping and HP sold it.

Grad: That's why was I surprised that some of the others didn't start to sell hardware. I guess if it's an application program it has a different characteristic than if it's a systems program?

Mecham: Well, at Hughes Aircraft Company after we started the HP 3000 in a very technical research area it proliferated throughout Hughes. And, of course, Hughes was at one time one of the largest purchasers of HP gear. So the 3000 was bought directly from HP, with the terminals and everything else, for all kinds of uses. And then we used software from a myriad of people.

Grad: How important in this HP world and the applications world, was the one-stop shop? Because in some of the markets that was absolutely critical. The VARs were in existence because the customer wanted one point of contact for everything. They didn't want any finger pointing. At ASK you apparently felt that was certainly central to your business.

Browne: Actually no. The fact was that HP had a reputation for service. The hardware was well-built and it was an incredibly important component of our sale. And the synergy with the HP salespeople, the synergy with the HP support team was critical.

Services to Support the Products

Grad: How about services that you offered in conjunction with the sale of your software? Grace, you started with basically a business that provided services. Did you continue to provide services along with the software?

Gentry: Yes. In fact, a big part of our work as an OEM was not just providing the hardware and the software, but modifying the software products. It was also training the computer operator. It was training the programmers who might have been hired from an IBM company or somewhere else but needed to program on Hewlett Packard, et cetera. And we often were involved in supporting companies that didn't staff up for enhancements, et cetera. Any time they needed an enhancement or a modification, they had us do it and their staff operated it.

Klein: Abacus did the same thing. We were both in the same business. The first project where I encountered Abacus was a facilities management project where they were running the entire DP operation for another company called AFG Financial Systems. AFG had no people who knew anything about the technology: no programmers, or anything. It was all done by Abacus.

Grad: Orbit didn't provide services at all?

Klein: Not really. We did a couple of custom programming things for somebody who needed utilities along the line of what we were providing. But for the most part, no.

Grad: How about installation services? I'm thinking about the actual programming services of some kind, installation work.

Klein: Yes, Abacus did that.

Damm: We provided services. We started, of course, truly in the service business. But when we finally had a product that was saleable we confined our services to work related to our product. But it was not uncommon for us to go out and along with selling the spreadsheet help people build a financial planning system. And we would charge for some of that.

Grad: Charge a lot?

Damm: Well, in retrospect it doesn't look like very much, but at the time, yes. We made good money at that.

Grad: I was thinking the services business might be a very profitable adjunct for many of you.

Damm: Let me put my Quasar hat on for a moment. The problem with the services business, is it's good as long as business is good, as long as you're selling. But when you have a market contraction then your services people are a huge liability. And it's even worse if you're in Canada which has much more strict rules about laying off employees.

Woc: At Adager, we did not do any contracted-for services. In my previous life doing HP product distribution we did have to consolidate many times and do turnkey projects, and usually we just joint-ventured with some of the providers to be able to deliver a complete product.

Grad: But as far as Adager was concerned, it was not a significant part of your business.

Gentry: That was when it was to our advantage to have our contracting division, because we could bring contractors in to do turnkey installation and support. And then move them on maybe to another client that already owned an HP computer or some other equipment. We didn't have to have a very large salaried staff. We obviously had a core one, but we didn't have to have that large support staff that was so difficult to deal with during an economic downturn.

Mecham: Let me piggy back on that because that is very important. As an independent consultant I would support many companies. I became involved with Cognos and brought them into Mexico. So there were a number of independent consultants out there that really got involved with you people and it was a mutual relationship. In fact, I worked for Mark for a while doing a project. I wrote the TypeAhead Engine user manual. So there were a lot of independent contractors out there that did the servicing that you're asking about.

Browne: Rough figures, 40 percent of our income was services. Fifty percent was software sales. Maybe 10 percent was hardware and network, the kind of thing that Steve said, but 40 percent was probably services.

Damm: That 10 percent is just your margin right?

Browne: Ten percent was the margin from the hardware, yes.

Grad: He's not talking about total dollars of revenue on the hardware. He's talking about your piece.

Browne: My piece, if ASK made \$100 million, \$40 million of that was services, total revenue.

Gorfinkel: We provided installation and training service and that was about it, and telephone consultations.

Grad: Did you get paid separately for that installation and training? Or did you build it into your price?

Gorfinkel: It depended on the client. If it was in some place that neither of us wanted to go the training fee got very high. For a training session in Europe, it was basically expenses.

Bergquist: At AMS it was all for consulting fees. At this time that there was not a robust business software market. So we would find those companies who wanted a unique business solution and really build it from scratch. You used whatever tools were available. And then plugged in underneath those the stuff that wasn't mature enough yet.

Grad: Did AMS get much consulting work in the HP 3000 space?

Bergquist: Because we had an expertise we continued to get some big projects. Overall, I guess, for the whole company it was a relatively small percentage.

Thorpe: I'll just give the HP side of it. Probably until the 1980s we didn't charge for a technical person to provide any kind of software assistance. You had two kinds of technical people, those at the factory who were building things and trying to make it work. And the technical people in the field who were pre-sales and teamed with a salesperson to try to explain what the salespeople couldn't explain themselves. Although, I would say most sales people started out with a technical background. But there were only those two kinds of technical people. We didn't call our system engineering organization in the field a professional services organization until almost the middle 1980s. So that opportunity was left to our partners because we didn't have the capacity. We didn't have the talent employed in that way. We weren't charging for it.

Grad: Did you charge for your system engineers? Was that un-bundled or was that irrelevant to you?

Thorpe: I don't relate at all to the IBM event having that effect on us. I really don't know what finally convinced us.

Gentry: I know what IBM did and they didn't.

Grad: Yes, my guess is that the mini-market, DEC, DG, HP and the others ignored what happened in the mainframe world.

Reselling Software

Gentry: There are a lot of things you might ask us about fixed-price bidding versus time and materials.

Grad: Are you talking about the entire project or just the services work?

Gentry: Well, as an OEM, we often were asked to fixed price bid the whole deal.

Grad: And what did you say?

Gentry: Well, I mean it's a great way to lose money.

Thorpe: Who asked, the customer or HP?

Gentry: Primarily, it was the customer.

Sieler: I'd say a very large percentage of Allegro customers were other vendors, including Hewlett Packard. So that's a little unusual perhaps.

Grad: What kind of business? Did you get a royalty on resale or anything like that?

Sieler: Very rarely for things that we did for other customers. There are people here who should have been our customers. Steve, did we ever get royalties on anything that we worked on?

Cooper: Yes, but that was an unusual case.

Grad: But did any of you that did resale get a royalty arrangement?

Gentry: Yes, we got a royalty.

Damm: Just along the lines of this tangled web, Quasar and Cognos sold their software to companies like ASK who resold it and built it into their systems.

Grad: Did you get a piece of that resale?

Damm: There was one particular deal that became famous because it was a \$110,000 deal.

Browne: It was a fixed price and we got unlimited usage to resell it.

Damm: Unlimited resell of Powerhouse or, at least, Quiz.

Browne: Yes. And do you remember who might have negotiated that?

Damm: Yes, it was Richard Nelson. I delivered him to the meeting where he signed the contract. It was in 1981.

Browne: No, on our side, ASK's side.

Damm: I think Sandy [Kurtzig].

Browne: What a shock to me.

Grad: In her book she claims that she screwed up— excuse me, the wrong expression.

Damm: This may get edited out of the tape, but they used to call her the Dragon Lady.

Grad: That's not in her book. I looked.

Browne: I worked for her for 24 years.

Cooper: Burt, if it's okay, there's an important company who's not here, Robelle Consulting. You mentioned that Bob Green was invited. If I could speak a minute or two about them, as I think they had a different funding model and a different sales model and I think that's interesting. Bob Green was a summer intern at HP. He wrote the SPL manual. And then after graduating, he went to his accountant, and said, "I think I want to open a software business someday. What advice can you give me?" And he said, "Move to Canada, taxes are cheaper."

Gentry: So did he?

Cooper: So Bob did. He moved to Vancouver. He got a job at a hardware store working on their 3000. Rick and I ran into their database recovery utility. It was only \$1,000 and we couldn't figure you why it was so cheap. So we flew up to Vancouver. We spent a couple of

thousand bucks to try to figure out why it as so cheap. And then after Bob showed us what he was doing in his consulting job, he says, "You got a few minutes before your plane, come look at this software I'm developing at home." And he showed us what was going to be Qedit and we were both impressed. And we said, "This looks really nice, but there's already a free edit on the HP 3000, you've got to be crazy writing another editor. Who's going to buy it?" And he said, "Well, I'm not going to sell it." So I looked at him kind of strangely. He said, "I'm going to rent it." So I said, "What are you talking about?" And he says, "I'm going to rent it for \$1,000 a year." So I dismissed him as a double nut. Who's going to buy the product and who's going to rent it? And, of course, a year later, he had 1,000 companies sending him \$1,000 a year and Bob was in business.

Grad: Good story.

Cooper: But that was the way he got started.

Selecting HP Computers

Grad: Why did you pick HP instead of products from DEC and DG?

Dennis: The main reason for HP, they were right here for us. Local was huge for us. And their reputation was important. We felt that if we were to pick Data General or DEC we weren't going to get the attention that we would from a local company. That was the number one criteria for us.

Browne: The HP culture certainly from 1970 through the 1980s was impeccable in terms of the way they treated their customers, the way they treated their employees, the way they did business. That was important and they were local.

Gorfinkel: Again, it was the HP way. And the HP salesmen came knocking on our door. And also we had that previous knowledge – previous experience with Burroughs. This looked like an easy way to go. Dealing with HP up through the 1980s was a real joy, compared to dealing with almost any other corporation around.

Grad: Their hardware prices were competitive?

Gorfinkel: Their hardware prices were outrageous.

Gentry: HP's good for higher price.

Gorfinkel: I spent more for a computer terminal to use over a leased line than I spent for a new car.

Grad: So the relationship and its localization was so important to you that you were willing to pay for a higher-priced product.

Gorfinkel: Localization didn't matter to me but quality and dealing with HP did.

Rego: I went to visit DG and DEC in February of 1978, in that famous snow storm in Boston. I got stuck there. That was very interesting. My main focus has always been the bits and bytes, the low level stuff, that's what I love. And while visiting DEC and DG, they isolated me. I spoke to salespeople and managers and I found them boring. Then I went to HP in June 1978 and I met Fred White.

Fred White: I wasn't boring.

Rego: Yes, he wasn't boring. And we were able to speak bits and bytes, the low level stuff which I love. So I think that my reason for choosing HP was Fred White.

Sieler: For me it was a baby Burroughs. I was a Burroughs expert, and the fact that it looked so much like a Burroughs 6700 running MCP encouraged me to go move from Burroughs to HP.

Grad: Let me ask a question of you HP people; is there any reason why it looks like the Burroughs 5500?

House: Yes, we stole the system, basically.

Sakakihara: The people that were working on the MPE came from Burroughs. If you look at the stacked architecture, if you look at the language, you'll see a great similarity.

Grad: Was that a conscious decision or just happened?

Sakakihara: It just happened.

Browne: The first version of ManMan was based on the Burroughs Fact manufacturing system. We had the manuals. Does that ring a bell for any Burroughs guys? Burroughs did a really good job of a manufacturing description.

Damm: I was already at HP working as a consultant, and I traded working time for computer time. The thing that's so easy to forget nowadays is that it used to be so expensive to buy computer time to do development work. And it was so much a better deal for me to do this

development. I was able to put several years of engineering work into my product before I ever sold it. I could not have afforded that since I was bootstrapping my business.

House: Let me add that was true for Sandy too. She got a free HP 3000 for her kitchen.

Browne: It was not in the kitchen. We had the first HP 3000 on the computer floor at HP. Did you say kitchen?

House: Correct.

Browne: Yes, we got an HP 3000. We had to work at night, by the way.

House: But it was free time.

Browne: It was free time. It didn't work worth shit. It's true. But we got free HP time.

House: No, we used you to debug.

Browne: Pardon me?

House: You were our debuggers.

Browne: Yes, right. HP provided an open house in a lot of ways, I mean that's part of the HP culture. They were good partners. HP is an excellent partner.

Grad: So if the computers had not been able to sell, you would have been hung out?

Browne: Yes.

Klein: Actually, the machine was chosen before I joined the company. I joined the company as a PL/1 expert, trying to help them with some software.

Gentry: PL/1 was my first language.

Klein: I used PL/1 and FORTRAN for the 3000. They already had the machine when I joined them.

Grad: Was there the same kind of no decision involved then either?

Klein: I honestly don't know what their choices were.

Cooper: In my world, the world was divided in IBM and non-IBM. And IBM was a four-letter word when I went to college and worked at Burroughs. So I think my desire was to stay on the non-IBM side of things. And then Weyerhaeuser picked the 3000 and I felt right at home ever since.

Gentry: Originally we went in because we could tell a lot of HPs were being sold here. Then DEC and DG noticed that as well and opened regional offices and got active. We worked with all three companies and with Tandem. And the HP way, quite frankly, is what sold us after working with some of the others. There were times when we were asked by the other companies not to lie to clients, but to just not reveal all of the information. We were not comfortable with that. And HP was home for us. We love HP.

Grad: Bruce, you obviously worked with DG. It was your original company; it was the focus of a lot of your work.

Ray: DG was the focus and perhaps different than anyone else here, HP courted us because we provided access to all of the Data General VARs which was a significant part of Data General's \$1.1 billion per year in revenues.

Grad: So the programs would help port from DEC and DG over to the HP and vice versa?

Ray: Well, there is a certain fluidity about that.

Gentry: This was a river that ran in two different directions.

Ray: Yes, it did.

Mecham: Hughes had bought a lot of instrumentation. We had looked at DEC but chose HP because the 3000 operating system had an interface for the engineers as well as real time and we were going to pour radar data in the computer by the main bus eventually. So that was the reason we were willing to take a chance on a new system. And we had a lot of HP support.

HP Computer Performance

Alberts: Yes, there remains a paradox here. On this side of the table, people keep saying these HP machines didn't really work. But at the same time, others say they were of high quality, higher than other machines. The paradox comes when Steve Cooper was so eloquently

relating the 1978 meeting of what was INTEREX as a moment of awareness of sharing the troubles of getting HP computers to work with so many other people.

Gorfinkel: From where I sit, the paradox is resolved because the HP hardware was going to work. I have not lost a file in however many years that I've been using HP systems due to hardware. And the only time the machine has been unavailable for any length of time is when PG&E cuts the power. When you say it doesn't work, there are a lot of people in this room and in the HP world who were pushing the boundaries. They were trying to get an extra million items in their database, and they were finding things that didn't work. For those of us that were writing somewhat easier system utilities and providing end user code, my clients never had a problem with HP not working.

Grad: Let me ask one other question, was HP software the problem? Operating system seems like that in terms of where your glitches were coming in as against hardware.

Gentry: It was the software.

Grad: The software. Jack, are you relating to that?

Damm: Well, when Hewlett Packard pulled the original HP 3000 off the market, the problem was that their original plan was a machine that would not have a whole lot of memory, but would be brilliant about swapping stuff to disk.

Grad: A virtual machine effect?

Damm: Yes. And they missed. They were wrong. They couldn't get it to swap fast enough. And so they redesigned the machine and you guys have to correct me if I get some of this wrong. But the CX was the first machine where they expanded the memory on it and all of a sudden these machines did not become swap-out based. The HP 3000 always worked. It just was really slow when you tried to do certain things on it.

White: The Omega project which preceded the 3000 was going to be a 32-bit machine with a lot more memory, like two-gigabytes. But the top management in HP when they entered 1970, which was a depression year, were saying, "Well, we're spending all of this money down in Cupertino developing something we don't understand." HP top management never did understand. But anyway, they started to do the HP 3000 with 256 kilobytes of memory. And then they came out with that thing real time, and I thought, "You're not going to do that with 256 kilobytes;" but anyway, that was the basic problem.

House: I just wanted to pick apart this 'didn't work' thing a little more. There are several sizes of don't work. One is things don't work like pushing the boundaries, so 256K won't allow

you to swap in and out, so that's not yet design kind of doesn't work. And there were a lot of things about HP early computers where things were incomplete. Things weren't understood and we were working the boundaries. And in that respect is how I was saying things don't work. Let me contrast that with Digital's equipment that basically would run and then fail. That's very different. And they got to a point where half of the money the company got was for services to fix the crap that broke, and we never got past three percent spent on stuff that broke once installed. So you can hear the words, "it didn't work" and it can mean some very different things.

Gentry: Yes.

Cooper: In my mind it was software versus hardware. The hardware was absolutely reliable. It was a software problem. Case in point, there was a bug in the operating system where after 28 days a counter would overflow and you'd have a system failure. Every system up for 28-and-a-half days would be guaranteed to crash. And it took a few years before anybody reported or fixed this problem.

Damm: You could move files from one folder to another by doing the rename command. If the destination folder didn't have enough space, you just lost that file.

Ray: And looking from the outside, when we had to work with the different vendors, HP hardware was impeccable. The software was extremely difficult to work with compared to everyone else's software, besides being slow.

Porting to Other Platforms

Grad: At a point in time, mid 1970s, VAX/VMS comes out.

House: VMS was 1978.

Grad: Did that have any impact on your decisions to use HP hardware?

Browne: In 1978 we took a marketing stance that we needed to have a second source, and we completely redeveloped the system using Digital hardware and VMS.

Grad: So VMS was a factor ...

Browne: A huge factor.

Damm: At Quasar we actually wrote an SPL converter so that we could maintain our SPL code and still have code that ran on the VAXes. So we took my spreadsheet, for example, converted it from Basic into portable SPL which then ran on the VAX.

Browne: We doubled our revenue because we went to the VAXes.

Grad: Steve, anything that you had to think about at that point in time, or not?

Dennis: Yes, but it wasn't as a result of DEC. It was a result of Tandem. For us, we had a lot of clients who were looking for a fail-safe non-stop. So rather than do what ASK did and sort of duplicate what we were doing on DEC, we went the Tandem route.

Grad: Those who were doing systems software were really tied in very much to the relationship with the HP software. So you didn't really have options very much in those cases, right?

Bergquist: Well, as a consulting firm we had the option of going anywhere. And I think a lot of the problems we encountered were because the earlier projects had been successful and now we were pushing the boundaries. I've got a memo here of 1980 problems. There were problems like we can't add any more volumes to the database because we've reached the Image limit. So we have to use multiple databases. You can't do logging in multiple databases otherwise you lose stuff. So success basically led us to pushing all of the limits. We got our revenue by working around all of the HP limits.

Grad: Did AMS come up with any products on the HP?

Bergquist: Yes, we had one product. Environment 3000 was the product we had.

Grad: A systems product?

Bergquist: Yes, it was a layer above the operating system to work around the bugs or to make it more manageable so mere mortals could program.

Grad: But you didn't do any application packages?

Bergquist: Applications, no. We ended up doing custom applications.

Company Size

Grad: Most of you were pretty small organizations, from what I hear. So let me just go around and get a rough idea of size as of 1980.

Gentry: That's asking us to remember back then.

Grad: Oh, come on Grace. You remember what you had for lunch 35 years ago. Bruce, how many people did you have in 1980?

Ray: Well, that was actually a transition year. So that may have been a quarter-million in revenues.

Grad: How many employees?

Ray: That was when we were just starting out, maybe three to six.

Grad: No big organizational structure or anything like that to worry about. Grace, in 1980, just for this part of your business, not the rest of it.

Gentry: Well, then that would be two divisions because one was the products division on HP and one was the third party products we called it and that was the OEM, et cetera. Probably for permanent staff that would have been about 10.

Grad: But you were pulling in independent contractors.

Gentry: Yes, right. We had 100 contractors contracted at any one time and we could pull them in and out.

Cooper: AMS must have had had a couple of thousand employees at that point. But probably 10 to 20 of them knew 3000. And in Allegro it was always under 10.

Klein: Abacus, I think, was about 10 in 1980. I don't think we ever got larger than that.

Grad: How big was Orbit, that's later, right?

Klein: Orbit is later, yes. Orbit got up to, I think, 70 people worldwide.

Damm: The most that were in the Palo Alto Group was five people. We rented our software. Our annual revenues were around \$300,000 or \$400,000 a year. Cognos at the

same time was about \$15 million a year. And I don't know how many employees but it was hundreds.

Rego: Well, in Guatemala we were Rene, Alex, Lisa, four people, I guess, including my mother. And then we moved to Sun Valley in 1988. We grew to maybe 20 people. I was totally horrified. And we shrank by attrition, I guess, until we are now four or five people again.

Gorfinkel: Probably four people. It varied right around in there.

Grad: ASK is pretty big at that point, by 1980.

Browne: In 1980, we were about 150.

Grad: Good size. That's probably the biggest one at that point in time.

Gentry: Yes.

Damm: It was bigger than Quasar at that time.

Dennis: I was just looking at an old business plan. I think we were between 45 and 50 at that time.

Gentry: We didn't know you were that big.

Cooper: How big was the R&D lab for the 3000 at the same time?

House: A couple hundred about that time.

Sakakihara: In the 1980s one of my labs was running at about 150 people. And there were about four of those running about 100 each. So there were about 500 people.

Grad: Five hundred people all together.

Sakakihara: Yes, on the software side.

Grad: Steve, is that good or bad from your standpoint?

Cooper: Well, for my mind, obviously, a lot of people seemed to think 10 is a good number. And I think if you look at how many people built Image, how many people built the original MB, how many people built the SBL compiler, I think you're going to find teams of five or

10. Today, if you look at HP or Microsoft, you've got hundreds of people working on a software project.

Grad: The very interesting thing I am hearing is that you were small. A couple of you built your products in almost every case. You didn't have big teams of people to build your products. And I guess from what I hear is HP also had relatively small teams, building a software product, is that accurate in that period of time? Seventy to eighty when you were building some of your systems?

Sakakihara: Well, in the 1970s, there were small teams that were like 30. If you look at MPE with the HP 2000 software we had about 30 people including QA. But that grew as we reached the 1980s.

Grad: I'm just wondering how much the Fred Brooks Mythical Man-Month principle applied here. Brooks felt that in developing OS/360 they ended up using hundreds of people and Brooks still feels that slowed them down.

Browne: It did. Yes, as we grew we added more people, and the release cycles increased by orders of magnitude.

Grad: Did the quality improve? Or did that also decrease?

Browne: Well, I won't comment on that.

Grad: Yes, I'm going to put you on record on that. Chuck, you had a comment on that?

House: Let me give you a dimensional way to think about HP. In 1980 we had just crossed \$1 billion in total revenue. We had 91 divisions the next year in 26 states and nations doing research and development. And of those 91, most of them were not in the computer business. And of those in the computer business, the only things that were growing in terms of revenue were actually peripherals. The difference between the 2000 and 1000 families and the 3000 was that we organized the 1000 and 2000 lines as components. So you had a CPU division, a terminal division, a disk division and so forth. On the 3000 side McCracken said, "That's crazy." And since it was a commercial machine, it became recognized as a commercial machine. We allowed it to be one homogenous division. That whole operation that Ed had was, I think, around 350 people at that time, which included marketing, sales and manufacturing. So it wasn't huge by any of these standards that we're talking about. It's also worth appreciating that the 3000 was the smallest of our four product lines in a business that was only about half-a-billion-dollars. It was around \$135 million in 1980, that's all. So ASK was damn near as big as we were for that line. And the reason HP never got behind it was because the desktop calculators were outselling that stuff like crazy.

Sieler: I was in an R&D lab for the operating system in 1980, and I'd have to say it was on the order of 120 engineers. And I think it underlines the reason the 3000 was successful. You got things done on it much easier than any other computer in existence with the possible exception of Burroughs mainframes. It was just easier to write for, and I think that's why it was easier to maintain as a lab too.

Grad: Thank all of you for a very productive session.