



Oral History of Dan Fylstra

Interviewed by:
Thomas Haigh

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Dan Fylstra

Conducted by Software Industry Special Interest Group

Abstract: Dan Fylstra, a key player in the creation of the microcomputer software industry, describes his personal background and education. He covers his own blend of technical experience and marketing expertise. He was an editor of Byte magazine and cofounder of the Computer Dealer. He started the first successful software publishing company, Personal Software, which sold Microchess and other products. He then partnered with Software Arts (Dan Bricklin and Bob Frankston) to introduce VisiCalc, which arguably became the first killer app, selling tens of thousands of Apple II computers. Fylstra describes the marketing strategy used for VisiCalc and analyzes why it was such a high growth, profitable software product. He also explains some of the problems that later occurred at VisiCorp (the company name that replaced Personal Software), including disagreements with Software Arts. Lastly, he discusses why VisiCalc did not compete effectively with Lotus 1-2-3 and how this, when combined with the negative market reception of VisiOn when it was announced, contributed to the company's precipitous decline.

Thomas Haigh: This is an oral interview with Dan Fylstra conducted by Thomas Haigh. It's being conducted in the morning of May 7, 2004, as part of the Software History Center's project on the first 10 years of microcomputer software.

For the benefit of readers of the transcript: I'm not trying to do this entirely as a stand-alone thing because Dan Fylstra has recently written a quite long document outlining his recollection of the story as part of the preparation of this meeting. This document is included as an appendix to the transcript of this interview.

I am also assuming that the reader can access a quite detailed VisiCalc case study prepared by Professor Richard P. Rumelt of the Anderson School at UCLA [University of California, Los Angeles]. The original version was published in 1985, and the current version is dated 2003. That study is based in large part upon contemporary press accounts and interviews with the principals. At present, it is available at www.anderson.ucla.edu/faculty/dick.rumelt. Look for POL 2003-08 under Cases. It goes into quite a lot of detail and gives extensive figures.

Therefore, I'll use this interview principally to ask follow-up questions and to get some context and background and some more of your personal thoughts.

Background and Education

Dan Fylstra: I would also like to point to one other early document. In fact, it's probably chronologically the earliest of all the documents. That is a marketing research report that I wrote as a student at Harvard Business School sometime in the middle of 1977, a marketing field study course for my retailing professor. I have given that to the Software History Center so it should be available in the archives. It outlines essentially the conception and the business plan for personal software, the software publishing model, dealer distribution dealing with author's royalties, and marketing. And it has an assessment of the status of the personal computer industry and the PC software industry in 1977 based on my written articles because I had been involved with *Life* magazine and *Computer Dealer* and so forth. That would just be a source document for anybody who's deeply interested in the subject. [This document can be obtained by contacting the Charles Babbage Institute and requesting access to the supporting documentation associated with this oral history transcript.]

Haigh: I wonder if you could begin by filling in some of the context with your education and early life. It's well known that you came up with the idea for your company while at the Harvard Business School, and I've also read that you were an undergraduate in computer science at MIT [Massachusetts Institute of Technology]. I wonder if you could talk about what first drew you toward computer science and your early experience with computer technology.

Fylstra: Sure. Briefly, I was one of the people who became exposed to and interested in computers very early, as a teenager—really age 12 or 13, I think. Living in San Diego, I was first exposed through an Explorer course. The Explorers are associated with the Boy Scouts, and they pursue very special interests. This Explorer course was sponsored by IBM, and there was a mentor that I had, a gentleman named Carl Black, who was an IT manager at the California First National Bank, who got me interested. I sort of became a star student, so to speak, in the Explorer course and actually had my first job ever in the summer as an intern at California First National Bank in San Diego, writing PL/1 programs. It was me and a friend of mine, Henry Burgess; he went on to an interesting role at Microsoft. He was a very early player and got into XENIX and set up their email system and so forth. We're still in touch these days.

My very first computer was actually an IBM 360, writing programs in Cobol. I quickly moved on to Fortran and then PL/1 and so forth. Then whenever I had a chance, I would use a machine of some kind. While I was in high school, I was admitted to a UCSD [University of California, San Diego] special program and took courses there. I used a CDC 3600 there and have fond memories of my early use of computers there. Actually, I remember auditing a graduate course in computer science while I was still in high school. The course was taught by Irwin Jacobs, who has gone on to do other interesting things. All these things meant that by the time I got to MIT as an undergraduate, I was already pretty much committed to computers and computer science.

Haigh: During what years were you in high school?

Fylstra: Well, I was born in 1951, so you can calculate from there. At age 12, it was 1963, so we're talking about the early 1960s.

Haigh: I imagine it would have been quite unusual to have been able to have that level of involvement with computers in high school.

Fylstra: Yes, this was rare. The problem was that computers were pretty scarce and were owned by big institutions if they existed at all. So my exposure was first through IBM and the bank, and secondly through two universities: UCSD and San Diego City College was the other. It was a very different world from today, where computers are ubiquitous, which is partly because of the things that we did.

Haigh: During those teenage years, do you have a sense of what it was about computers that drew you toward them?

Fylstra: I think I had an early experience that now millions and millions of people have had with personal computers. A computer is a very involving medium, if you will, and I think nearly everyone who has a PC these days has that sense of just how interactive it is and how responsive it is when it's running right, and how frustrating it can be when it doesn't work.

In the early days, a number of us—and I think this is characteristic of many people who became involved with the PC industry early on—sort of had personal experience with big computers because we would use them at night and be the only person on the system. I remember persuading the operators to let me hang around at night—you know, the CDC 3600 is a big, expensive machine. We were on some kind of summer program, and we got to operate the machine: boot it up, power it up, and load it with punch cards. On that machine, everything had to be loaded from card decks when you first started to use the machine.

We had kind of a personal experience with computers. At MIT with Multics, where you had time-sharing access to the machine, you had something of a similar experience. I was just drawn to that like so many people were, I think.

Haigh: Would you say that you were a good programmer in those days?

Fylstra: Yes, in my peer group I was a real star. I was the best programmer I knew, although I'm not known for this. I'm known for my marketing role in the story of VisiCalc, and that's certainly the role that I played. It's kind of interesting, and I think Bricklin and I probably could have switch hit quite a bit on both the programming and on marketing because we both had computer science

degrees from MIT and MBAs from Harvard and so forth, but we just chose the roles that we did and pursued them, working together.

I still rate myself as a very, very good C++ programmer today, and I am still coming up a learning curve on C# and so forth. I still I feel very comfortable with one foot in technology and one foot in marketing. I view that as a strength for me. The role that I played in the design and development of VisiCalc is comparable to the classic role today of the software product manager. A product manager is someone who sort of needs to be able to have one foot in technology and one foot in the marketplace and mediate between the two.

Haigh: When you were at MIT, did you already know that computer science as opposed to some other scientific field was going to be your major?

Fylstra: Pretty much. I did a high school science project not just on compilers for programs, but on compiler compilers and transaction processing systems. So I was pretty deeply into it by that time.

Life at MIT

Haigh: What was it like to be a computer science undergraduate student at MIT at that point?

Fylstra: Well, there were a lot of us. Actually, in the years I was there, I think Core 63 became a separate major pretty close to that time. And I do think that while I was an undergraduate, the department was renamed from the Department of Electronic Engineering to the Department of Electrical Engineering and Computer Science. I think that my year of graduation was one of the first years when you could actually have something about computer science on your diploma.

I still very fondly remember those days because the intellectual climate, the intellectual environment at MIT and in Cambridge and the whole Boston area was just really stimulating in every way. It was challenging. There were so many interesting people and so much interesting work going on.

One of the great things about MIT is that there are research opportunities and programs and the access to the faculty that we had. My undergraduate advisor was Bert Tarn; I think he was codirector of the AI Lab at some point. We had a lot of access to a lot of other people who were just very good. So it sort of brought out excellence in people.

Haigh: Were there any other classes or professors you remember from your undergraduate education that had a particularly important effect?

Fylstra: A name just came to mind: Walter Savage, who was a professor at UCSD actually. He really did stimulate my interest in this pretty technical field called competition complexity; it's the theory of algorithms and their performance and so on. There were a bunch of people who worked on compilers and languages. I remember being aware of the work done by Frank Doreamer because I was very interested in compilers and parsing and cutting through languages and all this sort of thing. I think he got his Ph.D. about the time that I was an undergraduate student, but I was very aware of his work. I was reading the papers.

Haigh: I think you implied a few minutes ago that you were also involved with or exposed to Multics while you were at MIT.

Fylstra: Oh, sure. If you were an MIT student and you were in computer science or curious at all, you probably ended up using Multics. In those days, during part of my undergraduate life, I was in a fraternity and the challenge was to get one Multics terminal into the building. I was one of the agitators for this. So yes, Multics was very influential I think, for all sorts of reasons.

Haigh: Steven Levy has written about the hacker culture at MIT and in many ways how it was parallel to the official culture of computer science undergraduate students. Did you have an involvement with that group?

Fylstra: I was on the edge of it. I can't claim credit or whatever for any real hacks, but I was certainly aware of all the things that went on. The hacker culture has developed a lot since then. In those days, it was certainly present, but a lot of it in the early days had to do with hacking telephones and being able to make free long distance and business calls and that sort of thing. Hacking computers came a little later; it probably was just getting going at the time I was there. And 545 Technology Square—the building where the computer science laboratory was and the AI lab was, which was our official computer laboratory—that's where a lot of hacking went on.

Haigh: Levy used it more broadly to mean computer enthusiasts, hobbyists who lived to use the computer, whether or not there was any kind of course credit.

Fylstra: Oh, sure, yes, right. Most of us sort of felt that way. I will say one thing though, and this may be a little different from other accounts, but I know this first hand. When microcomputers came on the scene, in my direct experience, they were not real popular. People did not jump on them at MIT. I think the reason was that they had big computers.

I remember, for example, I was involved in the founding of *Byte* magazine. I was associate editor, and I remember bringing sample copies over to the electronic computer science and AI lab. We actually put in a call for papers we wanted people to write for the magazine. They let me put that up on the bulletin board. The attitude was a little bit like those machines were too primitive.

My first computer was a VAX. That was the classic DEC machine. My personal computer was a PDP-11.

Haigh: That was while you were still a student at MIT?

Fylstra: No, this was post-graduation, but only by a year or so. I graduated from MIT and went to work for this company called Intermetrics. I was working at the time primarily in the space program, working on the space shuttle. But one of the people working there was Carl Helmers; I got to know him and I found out that in his basement or something, in his spare time, he was designing a 6800-based microcomputer and publishing plans for it in *Popular Electronics*.

We began to sort of work together and play with computers. That led to Carl getting in touch with a ham radio magazine publisher, Len Green and Virginia Londner. That led to the formation of *Byte* magazine, and Carl was obviously the principal. I give him complete credit for the editorial side of *Byte* magazine. I was a helpful associate editor.

Haigh: Do you yourself have an interest in electronics, ham radio, and those more hardware-oriented things?

Fylstra: Not particularly ham radio. I've never been a ham radio operator. My business partner, Peter Jennings, was though. He's still active in ham radio. I was interested in digital electronics, though, and had fun with that. I had fun building circuits and that sort of thing in courses actually.

Haigh: When people talk about the origins of the PC industry, they're normally very much focused on the west coast, particularly the Home Brew Computer Club in the Bay area. What was it like at that point on the east coast in the MIT-Boston area?

Fylstra: There was a fair amount going on here, of course, and there was a lot of contact all the time. I think that goes back much earlier than a lot of people appreciate now. It turns out that the Arpanet, which is the predecessor of the Internet, played a big role in this. We were online all the time with each other. I mean, I can just remember so many conversations: Oh, how's the weather in San Francisco today? Oh, it's really snowing over here! We were on the Arpanet, and we had fun jumping around from one part of the world to the other visiting sites and that sort of thing.

Actually my brother, Dave, and my sister, Mary, both went to Stanford as undergraduates, and I'm pretty sure that my brother, Dave, was involved in the Home Brew Computer Club on the west coast. I think I probably went to a couple meetings myself fairly early on. But I just would say that there was this bicoastal phenomenon. It was a lot of people in touch with each other—friendships,

boyfriends/girlfriends, all sorts of things like that—between the San Francisco area and the Boston area.

Intermetrics

Haigh: After you graduated, what kind of options did you consider for work? How was it that you came to be working at Intermetrics, and what did you do there?

Fylstra: I had several job offers. One was with Data General and I did not take that, although I wound up doing a lot of work on their Data General minicomputers at Intermetrics. I almost had an offer from Intel, and it was a case where they called me and said, “Well, we almost want to make you an offer but we’re not!” But wait, there’s more to this story. The person making that phone call to me was Terry Opendyke. This was 1975. A few years later he came to work for me! So this was the Intel group that developed system software, including compilers, for the Intel microprocessors in Santa Clara. I had a background in technical writing, so that’s why there was an interest.

While I had a couple of other job offers, Intermetrics attracted me for a couple reasons. I had worked for them as an undergraduate, so I knew the company. It was a small company, great environment, very good people. And they promised me that if I joined them, they would send me to Europe, which they did for a year. That was quite an attraction for a young guy straight out of school. I was sent to set up a one-person office as their one-person representative to live in Holland, which is a natural for me because I’m Dutch by heritage, although I’m fourth-generation American, to work on the European space lab. It’s a laboratory that belonged to the space shuttle. Intermetrics business was focused around work on the space shuttle.

I spent a year in Europe. I was essentially working for the European Space Agency, which is a Common Market agency that supervised this project. Then I was sent out to work with the prime contractor and various subcontractors on the project. That experience actually is what got me interested in management, so I moved from engineering to management. It caused me to apply to business school. I hadn’t really thought very seriously about it up to that point.

Two things happened. One is that even before I left for Europe, I wound up writing a cross compiler for the Intel PL/M language for the Motorola 6600 microprocessor. I had done this for Intermetrics, and it was the first product that they had ever had. They had previously only done contracts for NASA and for the military. They didn’t know what to do with it really. For example, the advertising culture. They had only done 100% recruiting ads. They were basically a consulting and programming firm. I quickly learned that while I had developed this product, then what? How does it get marketed?

I went over to the European Space Agency, and I had a very interesting time there because I had

an unofficial role as eyes and ears for Intermetrics and indirectly for NASA Houston, which was going to receive the European Space Lab. I was this young guy who was kind of reporting back what he saw on the ground. NASA was very good about looking for things like that. What became very clear to me was that there were just hundreds of very talented engineers and scientists working on this space line station project at the ESA Center, but the overall project was being delayed and delayed, and everything I heard about were management problems. Everything I heard about it was that they haven't organized to do this and so on. It just very much came home to me that you could be the greatest engineer or the greatest scientist in the world, but management could be a bottleneck. It could inhibit you from getting anything done. I really wanted to get things done, and I really wanted to make things happen.

I figured I had to learn something about management. I actually applied to business schools from Holland and was accepted into three: Harvard, Chicago, and Stanford. I decided to go to Harvard.

Haigh: How long had you actually been with Intermetrics?

Fylstra: I worked for them as an undergraduate for at least a year and a half or something, and then post-graduation for about a year. It all happened pretty fast.

A Harvard MBA

Haigh: So your application to Harvard was motivated by this classic realization that the career path for ambitious engineers leads into corporate management, rather than by any specific entrepreneurial objective?

Fylstra: That's right. I don't think at that point that I was thinking about starting a company, although that idea was germinating because of the exposure I'd already had to the PC business through *Byte* magazine. *Byte* magazine itself was a start-up of sorts, and I began seeing all these little companies form.

A year or so later—the second year of my MBA program—I wrote the marketing research report. I had a unique vantage point because I was new products editor for *Byte* magazine. I got all the press releases from all these companies about things that were going on, so I was able to sort of analyze the industry and I just felt that there was a big opportunity. PCs were selling but they all had limited applications. A lot of the applications were games, but they really called for some serious software. So I was involved with *Byte* magazine and then I was founding editor of the *Computer Dealer*, which is a trade publication for computer stores, which were really just springing into being at that time.

I learned a lot about the dealers, how they were forming and how rapidly they were growing, but

also about their problems. Typically, they were computer-centric people; a lot of times they were computer nerds who formed the stores, and they were typically undercapitalized. The manufacturers who were supplying hardware to them were also similarly undercapitalized, so the dealers had thin margins to operate on, and they had to deal with a lot of things that were just not working.

I felt right away that there was a need for someone who could just deliver software that was reliable, that would work and fulfill the expectations of the customer and that was reliable and easy to buy and easy to sell. We were offering adequate margins and we offered reasonable terms and good products just so you could do that because nobody was. We had an opportunity.

I was especially conscious of these facts. I was almost standing back in wonder at it, because I learned through our business school program about the regional distribution systems in other industries and all the issues that arise there where you have competing stores and you have independent outlets and you have regional chains and all the high stakes issues that arose there. I was aware that here we had a channel in formation. Here we had a new distribution system that was just sprouting up all over the country. It dawned on me that with very little money I could form a company and I could enter this business and grow with it.

Haigh: How was business school in general? Was it a change of pace from the intensity and technology focus of the MIT culture?

Fylstra: Oh, it was intense! No change in that! In the workshop session we had on VisiCalc [at this PC software meeting], I talked about this and so did Dan Bricklin. It was very challenging. I came to business school, and in my own background growing up I had no exposure to business issues, in contrast to my wife who grew up in a family where her father founded a paperback book publishing company. Her mother was also an entrepreneur and founded a company. So for her, discussions of all these business issues was kitchen table conversation.

My father was a Christian minister and my mother was a teacher; she taught Latin, French, and English and they were social workers. The conversation around the table was very different. I learned the King James version of English. I was kind of a blank slate in terms of business education when I arrived at Harvard Business School, and I just absorbed everything I could. What captured my imagination was marketing. It was analytic and yet it involved risk-taking, and that really appealed to my nature.

I was probably influenced by the fact that my very first class on the very first day was an industrial marketing class, taught by... I can't remember the professor's name but he was brilliant and an outstanding teacher in his field. I still remember the case study method and everything and all the new students there. The first question he asked, I was not asked, but the first person who answered was very prepared and had some marketing background and gave this really impressive

answer. The whole case study method moved very fast, and I was just very challenged. I thought, “I’m going to have to do my best here,” and I did.

Haigh: It’s interesting in some ways that with your background you weren’t more drawn to operations research or to MIS [management information systems], which I know was a significant area at Harvard in those days.

Fylstra: That was deliberate. I thought I had a very strong quantitative background to begin with. I understood the analytical stuff, and I wanted to learn what I didn’t know, including disciplines of finance and marketing and so on. I was kind of aware that quantitative methods are all the intellectual side of things, and there is, for lack of a better word, a visceral side of things. I wanted to sort of test myself in areas that were outside the normal computer nerd framework. I had lots of opportunities to do that.

Haigh: People usually say that the advantages of an elite business school come in large part from the cohort of people that you’re with, both in terms of the bonding at the time and the networks later on. Did any of that play an important role in your own career?

Fylstra: Less so than probably for most Harvard Business School graduates because I was a bit of a loner. Although I had good relations with my classmates, I can’t really remember forming real strong friendships that lasted for years later. I sort of generally kept in touch with people, kind of cordially, but not that kind of real strong relationships. The ones that I formed were actually outside of business school. For me, and for Dan Bricklin, I think, this was much more important. We had a lot of contact even after graduation with many faculty members.

Personal Computers

Haigh: Let’s move back to the personal computer story. Some discussion of the early personal computer community has implied that there was an almost utopian kind of faith that this new technology was going to do great things and change the world. Was that something that appealed to you?

Fylstra: Very much. I said the other day that we all had stars in our eyes. I can remember that when I graduated from HBS in the spring of 1983, my classmates gave me, as a joke, the Computerized Universe Award. That was because I had been talking incessantly about personal computers, and I was saying we’re all going to have one. I was actually saying we’re going to have them on our desks in business first. A lot of people were saying we’re going to have them in our homes—that also happened later. And that was very amusing to my classmates.

There was a special sense, even from the standpoint of those of us who'd been involved in the computer industry already. I had worked on mainframes; I had worked on minicomputers. And these microcomputers were special. A lot of people looked down on them as toys, and I would just sort of look back with bright eyes and say, "Just wait! We're going places with this!"

In the sense of its impact on business, it was the same thing. I just sort of felt like we were going to change things. It's funny—it wasn't like political change. It was like, "We're going to make business and people's work more efficient, more productive." We are going to accomplish that. It sounds like something from a typical 1960s protester, but it was a way of changing the world, and it was something we were actually able to do.

Haigh: You mentioned this document that you produced. This was essentially a term project in a marketing class?

Fylstra: It was in marketing field studies. It was just a one-person project; it was a way for me to get academic credit for what I wanted to do in the second year. It was a nice piece of work, and I think I got an "excellent" on it.

Haigh: There were a couple things that struck me about it. One of them is that you're doing the industry analysis and you're talking about the niches that exist. One thing you talk about is marketing and dealers, which I think is an aspect of the story that hasn't come across as clearly in what's been written about it so far.

Another thing you do is survey the current market for computers, and you correctly predict that the S-100 machines are going to be outsold in the mass market by the commodity computer manufacturers.

Then you discuss what you think of the three main emerging machines: the Commodore PET, the TRS-80 from Radio Shack, and one other.

Fylstra: That's right. One that I had in there is a Heath LSI-11, which is based on the Digital Equipment Corp. CPU. At the time, I thought this could really be a winner because I knew how excellent the whole KD11 computer world was. I think there was a missed opportunity there. That could have been a winner, and the exact reasons why it never did become a player, I couldn't tell you right now.

Haigh: You notably don't mention the Apple, for which VisiCalc was of course written in the end. Then you say at the end: "My present efforts are focused on developing and marketing programs for the Commodore PET. The PET offers the best price performance combination and it seems a better bet for independent software offerings."

Using the Apple II

Fylstra: The Apple II was actually announced that year, and it was so new that it didn't really figure into this. But then what happened, when it did come out, we were interested in it. I can't remember the exact circumstances of place and time, but I wound up buying one, of course, and couldn't afford full price. Steve Jobs and I were at some event somewhere and negotiated a special deal. That first Apple II that I bought for Personal Software, which was already off the ground at that point, became the computer on which Dan Bricklin prototyped the first electronic blackboard or electronic spreadsheet version. It also became the test machine for the actual version of VisiCalc that came out.

Haigh: How much then was it a coincidence that it was the Apple II that VisiCalc was built on instead of, say, the Commodore PET?

Fylstra: I'll show you one little twist that I'm big on using, but then I'll tell you the reason. When Dan Bricklin came, he called me up and said he had an idea for the product and he described it. It was sort of a gleam in the eye at that stage. But he had the idea that it would be what he called a spreadsheet actually at the time. He was going to call it electronic blackboard—that was the working term. He was thinking of developing it on a machine he was familiar with, which was the DEC CDT machine that I think we've all not heard too much about.

Haigh: Do you know what the letters stood for?

Fylstra: I think probably something like Crystal Digital Terminal. It was a DEC machine, but it was kind of a big single unit. In that sense it was like a personal computer. That was his initial target for what later became VisiCalc. But he was interested in microcomputers. I believe it's correct that he had not actually seen or touched or used any of these machines—the Commodore PET or the TRS-80 or the Apple II—until he came to visit me in my apartment/office for Personal Software. But I didn't have the other machines available: the PET we were using to duplicate sets all day long and the TRS-80 we used for our accounting. So the Apple II was available. That's one reason I was able to loan it to him, but that makes it sound accidental, and I don't think that's true here at all.

I made this joke the other day, or Dan Bricklin and I did: We were not just computer nerds, actually we were computer nerds with MBAs! And we really thought hard about this and discussed it. The case for the Apple II was that I was quite impressed with Apple's marketing, and we were both impressed with Apple's technology. Both Dan and I were favorably impressed with the Apple II's technical architecture. It was in many ways a more open architecture that's useful for software developers than in the TRS-80. Things that we needed to use were more accessible, better documented, and so on. Then, I was impressed with Apple's marketing; they were already doing things, even as a very small company, that others were not doing. They were running full-page,

four-color process ads in the computer magazines, and it just made them look like a bigger company than the others.

The final thing was that I was aware that the Apple distribution system was open. That is, Apple distributed through independent computer stores, and we could deal with those stores. In fact, we were already dealing with a number of those stores for our early products of Personal Software: Microchess and the other games.

With the TRS-80, the only way we could sell the product would be to make a deal with Tandy/Radio Shack because it was a totally owned system of stores. As to the Commodore PET, of course, we did go after it with VisiCalc as a second target.

Another very big factor here was that these early machines all relied on a cassette tape as their “mass storage.” We had the core of the program on these cassette tapes. We were doing that, and we were very aware of the issues and the problems, the limitations, of analog tape cassettes for software—it was very hard to make them reliably. And we knew that Apple was going to come out with a disk drive. Dan reminded me of this: I guess I learned somehow from Apple that they had bought all the available production of floppy disk diskettes from one of the major sources, so they were going to be the only ones who could deliver in volume on disk drives and floppy diskettes. I think they bought a whole bunch of production from CE, actually, for floppy disk drives. That was important to us. We said, “Well, first of all, we need that and secondly, everyone else will. Customers will need this. This is going to give Apple an advantage in the marketplace, and that’s a reason for us to go with Apple.

Years later, reporters wrote that I said in an interview that it was those two things. It was the disk drive and the marketing that distinguished Apple from the rest of the pack.

Personal Software

Haigh: Moving back to get the chronology straight. You wrote a marketing paper at Harvard Business School?

Fylstra: A market research report, which by the way doesn’t have a title on it. The title page says Synopsis on it. I wrote that in about mid-1977, so I was still in my second year of business school. It was almost a year later that I met Dan Bricklin.

Haigh: How about the creation of Personal Software? Did that follow immediately after this report? As you founded the company, did your thinking remain exactly the same as you’ve set out here?

Fylstra: It was pretty similar in the start-up stage. I think we actually started making sales in the very first days of 1978. We did a lot of preparation in 1977, and the plan was carried out, as described in there. We published some of the earliest products and we wrote some of our early products. Most of them have disappeared now, but the one that was an exceptionally strong piece of software was Microchess. It became our bestseller. Before we knew it, it became the bestselling product in the industry at that time.

The big break for us in that case was actually making a deal with Tandy for distribution through Radio Shack stores. That pushed our volumes way up and also pushed awareness of the product and of personal software way up. Microchess became the first big seller; we billed it as the first gold cassette or gold disk because it passed \$1 million of retail value sales. By the way, that was not the end of Microchess. It went on to sell for years and years and years in dedicated videogame consoles. It has actually sold over a million units.

Haigh: I have that reprint, which is dated May 1979.

Fylstra: That's actually after I met Dan Bricklin and after the development of VisiCalc was underway, but 4 to 6 months before VisiCalc shipped.

Haigh: At that point, the whole back of the reprint has a very long list of dealers. I see a bunch of Byte shops, Computerland. Would you say you had pretty good coverage in all the emerging small chains of computer stores?

Fylstra: Yes, we had worked at this. Because we were advertising their names and no one else was. The few other software publishers were not doing anything special for dealers and we were. That helped us build distribution.

Haigh: After Microchess there was Star Trek, "a tour de force in a real time action strategy game," and "a graphics package for 8 kilobyte PET models."

Fylstra: One of the interesting things about this ad is there are screenshots. The screenshots for Microchess show, I think, the left hand one is probably on the PET and the right hand one is on the Apple II. It's very striking because the Apple II had much better graphics, and Microchess showed that off. From our standpoint, the popup was so much better. It was the same code, but the graphics were so much better on the Apple II. That was another reason why we just loved the Apple II.

Haigh: What was it actually like being part of the company in this pre-VisiCalc stage? Was there an office with people standing around as you talked on the telephone, stuffing tapes into bags? Did you hire an appreciable number of people?

Fylstra: That's pretty close. First of all, the office was in my apartment and also was behind Harvard Business School. We had people sort of coming and going in this apartment and working during the days, part time, but working pretty much around the clock.

I probably should give credit to my girlfriend at the time, my wife Shirley Grafter, who I married in June of 1978, because she was really the operating manager of the company at that stage. She recruited and supervised the people who filled the orders, and our biggest problem was we had so many orders to fill. We were constantly going crazy trying to get the day's orders out the door. I remember one cold, snowy winter day in Boston when for some reason we didn't get a mail pickup or something. We had so many of these cassettes in envelopes with postage all ready to go. We probably had hundreds of them. We went around finding every mailbox we could find in the snow and stuffing the mailboxes as full as we could and then moving on to the next mailbox just to get the products on the way to customers.

So it was hectic and it was kind of crazy. Another problem was we were trying to run all these computers, which drew a certain amount of power in this apartment. We were overloading circuits all the time and causing the fuses to blow in the building, and the landlord was very upset with us.

The Publishing Model

Haigh: The beginning of the market research report says: "My fundamental idea is to publish and market software for personal computers in much the same way that books and records are produced and marketed. I plan to solicit software from individual aspiring authors, select and publish..." etc. By the way, was the actual reproduction outsourced?

Fylstra: It varied. We did what we could. The only way, for example, to make cassettes for the Commodore PET was to make them on the PET. For the large volume of TRS-80's, we had to go to a commercial cassette duplicator. That presented lots of technical problems, by the way, because conventional audio equipment was not really equipped to record these things. So it was a combination of in-house and outsourcing.

Haigh: But the bigger point is that this is very much an attempt to take the book or record business model and apply it to software. In fact, there's a nice piece from this *New York Times* feature of Thursday, February 28, 1980. The article is "Small Computer Software Games," and it's on page D2. It quotes you as saying, "The company does not employ programmers. Just as a publishing firm doesn't have a room full of writers on staff, we don't have pure programmers."

Fylstra: Right. That was the model. Although in coming here, I was aware that I had a sense I couldn't foresee everything that would develop, of course, but I had a sense then. VisiCalc was important enough that maybe we ought to hire the guys who were writing it in a joint company, and I proposed that to Dan Bricklin. He politely declined because he had been thinking for years and

years, talking with friends for years and years about forming their own company.

I accepted that argument. We agreed that if I had Personal Software, they would form their company, Software Arts, and we'd write a publishing agreement between us and that's how it all worked out.

But in the long run, for a product like VisiCalc, I think that was the wrong choice. I think we all agree on that now. As I wrote in my write-up, there were later efforts to merge the two companies and it almost happened. Through some twists and turns of fate and other things going on, it didn't happen.

Haigh: I'm interested more generally in your choice of a model, because by this point there was an established software product sector in the mainframe industry. I think in the late 1960s and very early 1970s, when people were first thinking about selling software as a product, in many cases they tried that same model of being a publisher and a distributor paying royalties to authors. And by the mid-1970s, I think those companies had either failed or had acquired the intellectual property of their most important products. They finished up with the model where the company that was selling the product also owned it, whether they'd acquired it or developed it in-house.

Fylstra: I would have to say that I wasn't aware of the history you just described—that is, of this approach being tried and not succeeding for them. Although I will say it's easy to understand now why it didn't work in the mainframe software world, particularly for products that were of great importance to the individual companies, whereas it did work and has worked for a very long time in the publishing world. It has actually worked in the software world for many kinds of products. It's very appropriate for entertainment products. It was used for decades, really up to the present time, and is still used for entertainment products where there's a high creative content and not such a huge programming content. There are many different games, and it's not like one game takes over the market for a really long time.

Although it's true that even in that business now, it's become so complex that you're seeing companies form in entertainment publishing. I would say the inspiration for the model was in part from the book publishing and record publishing world. And even within the personal computer industry, I was by no means the inventor of this concept. I personally credited this concept of publishing personal computer software to a fellow named Charles Peddle, who was the marketing manager for the Commodore PET. He tried and had limited success with it, I think, because the company really was not terribly serious in backing him. He tried to create a software publishing program within Commodore where they would publish products and pay royalties for the Commodore PET.

There was another company called GRT that was actually a west-coast-based tape duplicator. It was a really large company. We were afraid of what they might do. They were getting into software

publishing but internalized just their tape cassette capabilities. That's where Vern Rayburn got his start, actually. Vern Rayburn went on to play a key role at Microsoft. When I first met Vern, it was at GRT.

Haigh: So it wasn't so much then that people looked at the mainframe software industry as a possible model and deliberately rejected it. It was just that there was such a cultural gulf between the two worlds that they didn't really know anything about each other.

Fylstra: I think that's fair, and I think that's right. I'll also just mention that the early products were not business oriented so VisiCalc, along with probably WordStar, were the very first products that turned out to be significant business applications. I think it's probably true that Peachtree Software, which was pretty early, also was built using the in-house model.

Introducing VisiCalc

Haigh: Moving on to VisiCalc, I'm not going to ask most of the obvious questions because you've already answered them very nicely in your write-up and time is limited. You've implied already that when you first came across it you knew at the time that this was something that had the potential to be a very different kind of product from Time Trek or Electric Paintbrush or even Microchess.

Fylstra: That's right. I had the vision. Our enthusiasm waxed and waned, but we definitely had thought that, first of all, this could be a \$100 product or something and not a \$20 product. Secondly, it would appeal to business and that everybody could use it, that a large number of people could use it.

Both Peter Jennings and I, along with of course Bob Frankston, really believed in this, and we bet the company on it. We took all the resources we could muster and put them behind VisiCalc. Peter actually deferred his own royalties on Microchess in order to provide more cash flow for Personal Software to spend on VisiCalc. In part, that money went in the form of cash advanced against royalties to fund the early development of VisiCalc by Bricklin and Frankston.

Haigh: Can you remember roughly what scale these development expenditures were?

Fylstra: This is tough. I think the cash advance was probably in the low five figures. I think our revenues at that time were probably about six figures. Maybe our revenues in 1978 were in the low six figures, \$100,000 or \$200,000. And our revenue in 1979 I think was \$800,000.

I started the company with \$500—that was pretty much all I had, and it was a full bootstrap. The economics of the business made that possible. Distribution was somewhat open so that with

limited money we could really gain presence. I remember being given 60 days or something like that. That helped.

The nice thing about software is it has a high gross margin and particularly because we did have mail order sales in the beginning along with VAR [value-added reseller] sales. The mail order sales and credit cards provided cash flow up front.

Haigh: Did you make any attempt, pre-VisiCalc, to gain outside investment in the company?

Fylstra: Not seriously. There was one episode where I had a conversation with the boss in a venture capital firm. I haven't told this story before, but I guess it's part of history. His name was Joseph Gal, and he's a prominent, very successful venture capitalist. He became interested and he did the sort of thing, the due diligence, that venture capitalists will do. At one point, he finally asked me, "How much money do you think you could use?" I did a little business plan analysis and tried to figure it out. It was not very much; I think it might have been \$90,000 or something like that. He said, "Alright, I'll invest \$90,000 for 50% of the company." I thought about that and said, "Well, that's interesting. I want to talk to some friends and advisors on this."

Through my wife's family I actually knew a fellow named Roger Green; I think he was the CEO of Arrow Electronics, which is a big electronics distributor. I talked to him about this, and he said to me, "You're working pretty hard on this. This is going to be your full-time effort and occupation, right?" I said, "Yes." He said, "Well, what's the present value of your future earnings or profit contribution? Is it more or less than \$90,000, and do you need the money right now?" Of course, by then, we were generating cash as it was, so I wound up turning him down. I've got to give Joseph Gal credit for identifying early on that it was an opportunity there, but I probably made the right decision for us at that time.

Haigh: I'm curious about the extent to which, when you first met Bricklin, the basic idea of the spreadsheet, as we would understand it was in place: the cells, the cursor moving, the instant recalculation, and particularly the formulae that are there but you don't see them.

Fylstra: Well, of course, someone has to ask Dan Bricklin these questions as well. Here I'm just trying to tell you what I know. I would say that when we first talked it was, as I said before, a gleam in the eye. There was nothing to look at. I don't think he had pictures or drawings or anything. But I do think that several key elements were there. I think columns and rows were there. I mean, they appeared in his first prototype version. The idea of having formulas, having cells, I believe it was somewhat later since I remember discussing it with Bricklin and Frankston in the attic and so on, about core decisions and naming.

The decision to go with A-1 was made later—I'm pretty sure of that. We did consider numbering the columns and the rows and naming the cells. We were familiar with programming languages

and particular variables had names. We did think about these issues. I think most of the essential ideas were there. The idea of columns and rows, the idea of formulas that would recalculate, and the idea that you change a number and everything will change, I think that was all there.

I think a lot of the artisanship is in the execution of the details. There were several factors that made VisiCalc as successful as it was. One was the whole idea of the spreadsheet paradigm. But the second thing that was very important is that the initial execution of this idea was really quite good. It was very reliable, it was very fast, and it ran in a remarkably small amount of memory. I want to give credit to Bricklin and Frankston primarily on this; they'd thought through many of the details and they had examples.

The other thing that I honestly think mattered a great deal was that we had a plan. We had a sensible plan for marketing the thing, and we had access to channels. There's a lot of work that we did with Apple; Apple was working with distributors, not dealers, and that primed the market for VisiCalc when it was finally launched.

So all of those things were quite important to the success of the product. It's a clumsy version of the basic argument for coming out first. I think there's a high likelihood that it would have been imitated by somebody else quickly and then who knows what product would have taken off. I mean, I heard years later about imitations of VisiCalc, or the basic spreadsheet, that appeared within six months of the first launch of VisiCalc, but I think that the combination of the finesse and the execution of the product itself, plus the distribution and the marketing made the difference. None of the other imitations had that. VisiCalc really did take the market by storm, and for a good period of time, there was nothing close.

Haigh: The concept of a spreadsheet itself, in an old-fashioned paper sense, was that something that you'd been exposed to during your business school education?

Fylstra: Just a little. I was aware of it, and we did actually look at big spreadsheets as used in a general ledger accounting binder and that sort of thing. In fact, some of Bricklin's original design notes are written on big spreadsheet pieces of paper that he had. He had those around intentionally.

Haigh: Another important ingredient I think is the use of the screen as a window into a larger worksheet. It was implemented very naturally, so that navigating within the screen was done the same way as navigating beyond the current display, with the window scrolling along to follow the cursor. Was that, in your view, an innovation at that point, or was it something that other kinds of microcomputer software were doing already?

Fylstra: It was new to microcomputer software, but I believe that idea probably came from word processors. It was important here that Dan had actually worked on a word processor when he

was working for DEC. Word processors had the same issue in that typically the screens were too small to represent the entire printed page. So on a character by character basis, instead of column and row basis, you'd have scrolling.

The scrolling effect in VisiCalc was even more striking though, because it was column at a time, row at a time. I still remember giving previews in the period of mid-1979, before the product was officially launched (it shipped in the fall of 1979), educational and selling presentations to Apple's dealers at their regional dealer meetings. The regional distributors had projectors, so we could give a full screen style presentation. The Apple had a pretty small screen and putting VisiCalc up on the big screen and then scrolling it to reveal additional information and then changing the numbers—there would be ooohs and ahhhhs. People would get it; they'd get the idea, and they'd be kind of thrilled about it.

The self-running demo package that we supplied with the software allowed a lot of people to learn about it just by watching. Then they started to play with it. That was quite important. I mean, it was important at the time that end users or prospective buyers came along to see this thing, that it could actually be demoed and the salesperson in the store could talk with some level of knowledge about it, enough to establish a level of confidence in the prospective buyer that they could use this.

That kind of did move it beyond the hobbyist stage. The hobbyists and the early adopters, they'll struggle with difficult, hard to use, technology. But to reach our broad market, we had to make it not be a struggle.

Selling VisiCalc

Haigh: VisiCalc has been spoken of as the paradigmatic killer application, in the sense that it was an application that was sufficiently compelling that people would go out and acquire the entire platform just to get access to that one application program. Was that something that you had anticipated?

Fylstra: I don't know. We would view this in the opposite way. We had to make sure that the computer was there so that we could sell the software. So we were kind of looking at it from the software viewpoint. Most people didn't own computers yet. The current shipments of computers in a given year were greater than the cumulative installed base every year for many years. So it was essential that computers be there and that we had a credible sales concept that included the software and the computer.

I've often said this: many people have commented that VisiCalc made the Apple II. That's a pretty commonly held view, in fact. Steve Jobs, as you know, credited VisiCalc and the floppy disk drive for the success of the Apple II. I'm sure there's validity in that, but for what it's worth, from my perspective—and I've always said this—that the Apple II was essential for VisiCalc as well. I also

think that the third leg, which is the distribution system, was vital. Here ComputerLand is the best example, because it was a successful franchise that professionalized all those independent computer stores. To me, that was the third leg of the tripod. All three pieces had to be there for this thing to take off.

Haigh: You mentioned demoing VisiCalc to Steve Jobs and others. At that point, did they already know who you were because of your status as an important producer and marketer of Microchess and other software?

Fylstra: Yes, I think they were aware of what we were doing and therefore willing to sit down and talk. We were colleagues already, so the doors were open. The number of people who were doing anything at that point was small enough that it was realistic for someone like Jobs to meet with all the credible players. But they were open, and they were very helpful.

I was deliberately trying to create an alliance with them, with them and Computerland. They were open to it, and we had lots of levels of cooperation, starting with Jobs and Markkula, and then to Apple's marketing managers. As we talk here, we're looking at a copy of a cover of *Computer Dealer* magazine where the front cover photo is of me and Gene Carter, who was in a key marketing position for Apple. He told us that Apple means business and will be backing up Apple II and the professional computer dealers.

Haigh: This is March 1980.

Fylstra: Right.

Haigh: You'd been the founding editor of that magazine?

Fylstra: Yes, but I wasn't anymore, by this time.

Haigh: Had that been while you were in business school?

Fylstra: Yes. I was the editor only for the first 2 or 3 issues, I think. They needed someone who had more time than I did, because I was in Harvard Business School, and secondly, I was trying to start this software company.

Haigh: We have limited time, so I'm not going to ask about the things that I think you have covered very well here, including the introduction of VisiCalc, the funding sources, and the relationship between the two companies.

Fylstra: If you don't mind, let me interject at this point a comment about the UCLA case study. I

think this is a pretty good summary, but one thing I think is a little misleading on page 5: it creates the impression that the dealer distribution effort, the strategy originated in 1980, was a change from the company's mail order origins. That's just not a correct characterization.

The dealer strategy goes all the way back to 1977 before the company started. It was executed in 1978. We had 500 or 600 dealers before VisiCalc was launched in 1979. In 1980, it's absolutely true that the marketing team that we put together did a whole lot to professionalize and extend that dealer distribution system, to better implement the strategy.

Organizing VisiCorp

Haigh: Looking at your original proposal, and considering your own computer dealership in New York, it seems that you were attracted to marketing to a broader extent than has really been appreciated. Marketing was one of your core interests. Among the things that are discussed in your own article, and in that case study, is hiring of other key individuals at what became VisiCorp. It seems like the biggest change that was going on was a shift toward the creation of an internal development capability.

Fylstra: Yes.

Haigh: Was that your idea? Was that something that Terry Opdendyck instituted?

Fylstra: The impetus for that came from Terry Opdendyck. I was also going in that direction, but I believe the primary impetus to do it came from Terry, and he had the experience base to do it too. He had a lot of experience in managing software development.

Haigh: Once he was hired, how did your role change?

Fylstra: Quite a lot. Up to that point I had really been running the company on a hands-on, day-to-day basis and was absolutely stretched to and beyond my own experience level. Bear in mind here that I'm like one year out of an MBA program with no prior business experience.

So what changed was that Terry actually became president and COO. I was chairman and CEO. I think to be fair because of the way that the CEO is classically understood today, you could almost say that Terry functioned as president and CEO and I functioned as board chairman. It wasn't quite that extreme either; it's probably in between. My role shifted. First of all, I was Mr. Outside, and he was Mr. Inside. This is a classic division. A fair amount of my time went into being the public spokesperson for the company, doing presentations, visiting with the press, and so forth.

Then the other thing that I spent a lot of time doing was working on company strategy, looking

forward beyond the current product line. There are things that actually haven't been covered in any of this discussion that I spent a lot of time on over the next few years that had to do with moving the company into communications and networking in particular. I felt that was a real opportunity.

That ended up, years later, to represent a real value for the company when we were downsizing and selling assets and so on. It turned out that in 1984 the most valuable asset we had was Communications Solutions, which was a subsidiary company, which I had negotiated to acquire a couple of years earlier.

A lot of my time was going in this direction. I actually was not, however, the person who was the strategist behind VisiOn. I have to give credit for that to the other people in the company. I think that's reasonably well described in the UCLA case. It was Terry's impetus and Roy Folk and Richard Melman.

Haigh: Did you yourself feel that it was necessary to move away from the original publishing model?

Fylstra: Well, necessary is too strong a word. But it was advantageous to do so for at least some of our products, yes. There were advantages and disadvantages, and it definitely took capital and time to develop products in house. You were not guaranteed to get the best product. Essentially, you were now the author and there might be, and there often was, another independent author out there who developed something better than you did.

This is an argument for the publishing model, that as the publisher you are able to select, hopefully among several choices, from externally developed products. If you do it in house, then you have to do the best you can, and you are really in competition with entrepreneurially minded people outside. I think that happened to VisiCorp, for example, with VisiWord. VisiWord was developed internally. All the work was farmed out to a contractor, but no author was paid to develop it. There were problems and so then the project was taken over and done in house and it never quite lived up to the performance requirements for a word processor. We were competing with people who were just doing that one thing and doing so in an entrepreneurial way. That was the disadvantage of in-house development.

Haigh: From what you've said, it sounds also as if attempts were made to introduce a somewhat more rigorous, more traditional method of software development than had necessarily been the case previously.

Fylstra: I think that that actually evolved from being in the company, because we were all serious, well-qualified software developers. VisiCalc was developed to an extremely high-quality standard. But I think that they might say that it was something like what's currently in vogue: extreme programming. This is a combined discipline with a sort of cross group/individual effort. I

think in many ways VisiCalc was developed that way.

From a pretty early stage, Personal Software and then VisiCorp did follow formal software engineering practices and product release practices. I remember giving a presentation at an ADAPSO meeting about our software engineering practices. There were a lot of people in the audience—that particular seminar was pretty packed—and people were very curious and skeptical because they couldn't believe that you could take a product and ship it to 10,000 or 20,000 or 50,000 people, all the same copy of the software without bugs, without having to have continued relationships for maintenance and updates.

What I described I think was a little surprising to the audience, because they thought of us as the amateurs and as creative programmers in garages, but not as practicing developers. In fact, though, we were, and I outlined the process that was probably familiar to them. It was just the case that we actually operated to a very high-quality standard.

The problem is that the programs at this time were challenging because the hardware was so limited, although they were not as enormously complex as the kind of systems we have today.

Haigh: Or the systems like Multics that were existing on the larger machines earlier.

Fylstra: That's probably true.

Computer Dealers

Haigh: Another thing that comes from your accounts leads back to this focus on dealers. You use the term “anti-marketing” to describe the problems caused by the decision of Software Arts to sell VisiCalc directly to consumers at a budget price, which you argue caused the product to vanish from the dealer channel. That brings up the bigger question of the role of dealers in the success of VisiCalc. In order to supply the product without a team of thousands of consultants to go and oversee its use, a lot of that responsibility for frontline support, sales, user assistance finishes up with the dealers. I think you had mentioned that that's why you had to give them a good profit margin. How successful would you say the dealers were in filling those roles?

Fylstra: It's all relative is the best way to put this. First, they were clearly successful enough to generate the sales level that we saw in this area. But if you spent any time in a computer store, you knew that there were limitations on just how good these people were. It's still true today.

Actually, I would say that the caliber of people in computer stores on the sales floor today is much lower than it was back then. At least back then you had people who were relatively technically interested and knowledgeable about computers. They had their limitations but it's all relative. They

were better than anything else, and they were sufficient to the task.

You also have to put this in the context of the evolution of this market for personal computers and software. You can compare it to the evolution of the market, for example, for component hi-fi stereo equipment and lots of other kinds of products where, when the technology is new and the application is new, people don't need a lot of assistance to get started, but they do need a level of assurance. They need somebody that's been there who they think they can come back to with questions and so forth.

This was the era when the role of the dealer providing that kind of assurance and support, sales and support, was most important. Over time, of course, it's changed because as with hi-fi's and stereos, which moved from specialty hi-fi dealerships into mass merchandisers—as with lots of other business products, like copiers and so on—the personal computers eventually moved from the dedicated specialty regional computer store to a variety of other channels.

It's interesting because there were a number of attempts to sell these things in department stores in the early days, and it failed. Then finally there were computer stores within the department stores, where they actually brought in people who had that computer store background, and they were much more successful. Then given enough time—and this probably took the full decade of the 1980s to play out—customers, especially business customers, became familiar enough with these machines that the department store retailer diminished. And with that, the margins in the retail channel shrank.

Eventually of course, you saw all of this change, and you saw Microsoft selling directly to corporations for a very big part of the volume, and you saw Dell bypassing the stores altogether.

Haigh: Did you do anything to support other kinds of involvement of users such as user groups, magazines, that kind of thing?

Fylstra: Yes, we did. We tried to have a lot of contact with user groups that formed and with the magazines that were springing up all the time in this era. We were active partners; we tried to cover all the bases.

As you might expect, some things were easier than others. In some cases, you had an opportunity for the leveraged exposure, so you'd run an ad and you could reach the circulation of that magazine. Other things like user groups required footwork, essentially. They require people going out and meeting individually with these groups. We did as much as we could, but I don't think we ever adequately covered it.

New Products

Haigh: Moving back inside the company, I think you had written that 50% of the revenue at one point was coming from these other Visi products.

Fylstra: A little less than 50%, but the numbers in the UCLA case study are probably about right. It varied from quarter to quarter, but it's pretty close: 50% at the peak.

Haigh: Did those products have a life independent from VisiCalc?

Fylstra: This is kind of interesting because it was part of our strategy to try to diversify the company so we weren't so wholly dependent on VisiCalc. But it was also part of the company's marketing strategy to brand the products with a Visi name, an integrated product family, and do everything we could to make the products appear to be a family in the packaging and in the way the screens came up initially and the names, of course.

What we found was that we ended up with a highly correlated portfolio, like having all your stocks in the same industry in your stock portfolio. We found that as VisiCalc sold more and more, the other Visi products sold more and more, but then it also operated in reverse. We thought that this would have a balancing effect; we didn't realize the extraordinary degree to which these products were linked to VisiCalc. Whenever VisiCalc sales started to decline, the other products literally went down in proportion.

Business Relations

Haigh: How would you characterize your personal relationship with Opendyck and the other executives?

Fylstra: I think we were, for the most part, on very positive terms. We were trying to build the company; we were working together. There's a period discussed in the UCLA case study where there was a lot of internal friction between Terry and the next level of management. I do not think there was that kind of friction between Terry and me. Well, the big difference, of course, is that I wasn't reporting to him.

Throughout this whole decade-long period, I think I was perceived and hopefully I actually behaved as a very nice person. In general, I had the reputation of trying to be fair and so on. I was very much aiming to support the others in the company in trying to be constructive at all times, and I tended to see the best in people; that was a strength of mine. I could see the best in people, including people who didn't have college degrees, but had other skills and people who had rough edges but had promise. I would see the best in people, but I would not necessarily see the worst in

people. It's one of those things, it's a drawback that I might miss the worst in people, and particularly I think I would miss it if people had a hidden agenda. I'd tend to assume the best until I really saw evidence otherwise, and sometimes that worked against me. It does work against you in business. You just have to pay close attention to how people are behaving, what their agendas are.

But I would characterize the relations between Terry and me as very constructive. There was one period where Terry brought in a consultant, and the consultant raised a bunch of issues and so forth. But I prefer not to dwell on that; I don't think that reflects the main line of the story.

Haigh: Did you feel that you were part of a community with the leaders of other personal software firms? For example, through the ADAPSO Microcomputer Software Section or its Roundtable conferences. Did you meet and discuss things with them on a regular basis, or were they more distant?

Fylstra: I'd say sort of in between. Yes, certainly I saw these people. I knew them all, and we were all on a first name basis. On the other hand, I would say I wasn't as close to those people as maybe some others were. For example, I don't think I was as close to the group of people, partly because of geographic distance. I wasn't as close to the group of people who all knew each other and saw each other every day or frequently in the Boston area.

I knew Bill Gates very well. I knew Gary Kildall very well, and I met Larry Eisenberger and all these people; we had some direct early contact. But actually, it was kind of in between. There were a number of paths explored but not taken, and I probably have my share of those episodes and lots of other people did, too.

There were several discussions about potential mergers between companies in this business. You could almost take any pair of companies and assign a 50% probability that there was a merger discussion. So of course we had serious merger discussions with some of them. There was actually one point where there was some serious talk between us and Microsoft. There was a point where I made a real effort, in the VisiCorp heyday, to make a deal to acquire Informix. It would have been a really great deal if we had managed to pull that one off.

We had several kinds of alliances and joint ventures with companies like 3-Com for example. There were a lot of interesting combinations that were explored.

Haigh: What I think is interesting, given your personal background, is that you never went into producing language products, unlike of course, Microsoft. Yet you have said that that was where your original programming interests and your computer science enthusiasm lay.

Fylstra: Yes, it would have been interesting if we had started producing code for programming

languages. Why didn't I? One reason is that compilers are a very challenging development project, and it's probably not suitable for the publisher model. In our little circle of people I was the only one, I think, who had that background, and I was pretty occupied with marketing and the business.

It was a trade-off, which I've thought about. I'm happy with things the way they were, but there was a certain alternative project, where I was a developer.

Haigh: That's true.

Back to Development

Haigh: You've said that you don't want to dwell on later developments, but I was wondering, shifting back to a more hands-on developer kind of role, how did you feel about the transition from a pretty much exclusively managerial role to one where you became again a hands-on developer?

Fylstra: That didn't happen in a serious way at VisiCorp. That's what you're asking about, right?

Haigh: I'm asking in general. After VisiCorp, you mentioned that you've now become a hands-on developer again.

Fylstra: How do I feel about it? I like it a lot! So very briefly, in the company that I still actually run, Frontline Systems, there's a lot of code that I've written. There is also a lot where a hands-off approach was much more appropriate. It's probably fair to say that I know a lot about the internal architecture for just about everything we sell. I know a lot about the algorithms and methods and so forth. It is a comfortable place to be. I mean, it would be easy to understand that for someone like me who's been through the throes of the software publishing model that one would be a bit cautious about third-party relations. Frontline Systems does licensing, and we effectively publish certain software, but in every single case we defer to development on that software. In every single case, we have source code, and we essentially have control of the ability to work with builder versions of the product.

It's probably worth saying a little more about this since we have been talking about this contrast between in-house development and publishing. That's not a black and white thing. There are intermediate alternatives that can be quite attractive. It all depends on the nature of the relationship that you find through what's really software publishing and software licensing. I think it works pretty well if you get a good relationship with the vendor. For example, it's actually common; every software product is actually built on an existing code, even if it's just the one-time version that the compiler provides.

But increasingly today, there's much more than that. In a commercial product, there are all kinds of components that you can buy in the marketplace and can license and get rights to, and you can use them in your product. There's a whole spectrum here of licensing code and source for it. I think at this stage I really do have a feeling for it; I still can understand at a real explicit level what we need to have and know in order to be able to ensure that we can produce the next version to support the product and so on.

I think that probably the prevalent form of "software publishing" today is a blend of licensing, further development, ongoing support of source code, and marketing.

Competing with Lotus 1-2-3

Haigh: Moving back to the later days of VisiCalc, you set out very clearly here the case that there was a specification drawn up for a much improved next-generation VisiCalc that would have taken better advantage of the PC, and that this was never fully realized. You mention that something was delivered in the end and that it wasn't felt to be marketable. Do you feel that if that spec had been implemented exactly as written and exactly on time and the launch of Lotus 1-2-3 had still gone exactly the way that it historically did, that the improved VisiCalc would have been able to hold its own?

Fylstra: I think it would have held its own for a good, long time. I think the comparison you make is: fast forward a few years, now look at Lotus 1-2-3 facing the competition from Excel. Excel did win, over a period of years, but it took years and took huge investments for Excel to overtake 1-2-3. What's the big difference? Lotus had complete control of the product. Lotus did improve the product but not that much when you compare 1-2-3 release 3 to VisiCalc in its advanced version.

But at least they had control of the product, the ability to enhance it—not everyone knew that they had control of the product. I think these things had played out differently in the case of VisiCalc. There's no question that 1-2-3 was so good that it was going to be a very big challenge to VisiCalc; it probably would mean that it gained number one position, but VisiCalc could have held on to the number two position for a long time and still made a lot of money.

VisiOn

Haigh: I think WordStar actually had a much more prolonged decline.

Fylstra: That's right. And that's another case in point. There weren't the forces at work tearing it down. The unusual thing about the VisiCalc story, and VisiOn also fits into this, is that so many people were working so hard to tear it down.

We had a session at this conference on marketing, and it was an interesting group of people—people from Lotus, people from WordStar were there and I was there. Seymour Rubinstein made an interesting comment that did bring back some memories of the period when VisiCalc was in decline and VisiOn was just being released and the market wasn't reacting to it and the industry wasn't reacting to it. Seymour made the comment that, "You were vilified." He was saying it to me and about VisiCorp: "You were vilified." The reaction was much more negative than you would expect from just a normal kind of product-competition situation.

And I'm not sure why. Some people put this on Terry Opdendyke, and I don't think that's fair. There are probably some people who were sufficiently unhappy with him that they didn't like VisiCorp on account of him. But in retrospect, it's sort of a business strategy lesson. If you were VisiCorp and you announce VisiOn, what you are doing is you're kind of threatening Apple Computer and Steve Jobs personally, because the Mac is not yet out. You're upstaging Steve Jobs. You're threatening Bill Gates, who probably started the development of Windows the day after he saw the first demo of VisiOn at Comdex. You are threatening other people; I could do the research. And you're threatening Software Arts. Software Arts was supposed to be part of it, and they chose not to be, but in the end, they come through in the clutch.

So, was VisiOn a wise move? That was something that we just didn't really seriously consider. Were we big enough to withstand the reaction to that threat? In the end, I think we weren't. Everyone turned against us. It became in everyone's interest to see VisiOn fail, so we had a lot of negative buzz. In fact, the least pretty part of this is during that time period, somebody, and I don't know who, started printing buttons that said, "VisiCorpse." We heard about this and somebody was passing them around—one of those things. It was a little bit ugly what went on in that era.

So why exactly? First of all, how did VisiCalc decline so rapidly? There are active reasons why. There was an anti-VisiCorp movement, and I've often pictured it this way: Imagine a big hall, and at one end you've got this enormous fan forcing air into copies of Lotus 1-2-3, and at the other end of the hall you've got this enormous fan drawing air out of copies of VisiCalc at the same time. It all happened very rapidly.

Relations with Mitch Kapor

Haigh: I imagine that something else that must be a little bit tantalizing is the fact that, prior to founding Lotus, Mitch Kapor had been working for VisiCorp.

Fylstra: Right.

Haigh: Can you imagine any kind of scenario in which something like 1-2-3 could have been constructed within VisiCorp?

Fylstra: If we had kept Mitch in the company, maybe that could have happened. But it was controlled by our relationship with Software Arts. I mean, Personal Software, VisiCorp, was probably the only place where because of that contract we couldn't build an entirely new spreadsheet. We couldn't build 1-2-3.

Haigh: That's true. Actually, in the case study there's something about Kapor having a noncompete agreement with a loophole in it. They used the phrase "language-based spreadsheet."

Fylstra: Right.

Haigh: What did that mean?

Fylstra: He had this plan, which probably was a precursor to Lotus 1-2-3. Roy Folk spoke briefly about this because he was actually the person who dealt with Mitch on this issue. We had the right of first refusal on new products from Mitch because of our deal on VisiPlot and VisiTrend. This software product was subject to our first refusal, and there was a write up on it, which was given to Roy. Roy was convinced that we shouldn't do anything with it. It was run by me. If you read this thing, it doesn't sound anything like a spreadsheet. It didn't have words in it, unlike a spreadsheet, this calculating language. And exactly how that related to what Mitch ultimately did, let's just leave that.

Haigh: But it was enough to get an exemption in the contract?

Fylstra: I actually don't know.

Back to VisiOn

Haigh: We have very little time left. You wrote in your document that "we resolved to build" the VisiOn system. Whose idea actually was it?

Fylstra: I give credit to Terry Opdendyke for finding Scott Warren and the other people. I think I'd probably give a little more credit to Terry than the way it reads in the case study, which makes it sound a lot like Roy Folk.

But I don't think it's important to try to say who was behind this. I would say that I was not an originator of that idea or the original proponent, but I did buy into it over time. As Roy says, I was skeptical about things like pointing with a mouse at that time. But ultimately, I got comfortable with it and started using a mouse, and it got to the point where I at least felt okay.

Haigh: Had the individuals most involved in the project been exposed to the famous Xerox

PARC project?

Fylstra: Sure. That was pretty widely known and understood at that point in time. It was a topic of great interest. People were essentially trying to play their hand. People in general felt that this was going to be the future of the next generation, and we were one of the people trying to pursue that.

Haigh: There was a general consensus that that was the future.

Fylstra: Yes.

Haigh: You've alluded to the strategic situation, which was essentially that in one bound VisiCorp was trying to become what Microsoft had become by the late 1990s: providing both the leading operating environment and the key productivity applications to run in that environment. The case study focuses more on the issue that the system was a technical miracle, but because of the inherent limitations in PC hardware at that point, it just ran agonizingly slowly.

Fylstra: Yes, and I think that is really true. The way this thing ran on an 8088 processor or on an IBM XT, it was slow. There's a technical review here that indicated just what it was like. It was actually remarkably fast given how much work it did. But that was an issue. IBM was coming out with the PC/AT; we had one back in the lab. It ran a whole lot better than the XT, but there just weren't enough of them soon enough.

There is more to the story. I think it wasn't just a matter of the hardware. I think it was a matter of the market not being ready or where the market wanted to go at that time, independent of the hardware. You have to bear in mind that early adopters had started out in the market, and we had moved from the early adopters to the beginnings of the mainstream. But we had a long way to go with the mainstream adopting these things. We were in the phase where we were past the early adopters and the mainstream was beginning to move. But the mainstream does not want to buy radical new technology. The mainstream wants to buy the same technology that the early adopters have already bought and proven. They wanted to buy character-based, conventional single applications, things like 1-2-3 which is a natural, better version of the standalone spreadsheet. It was too big a move for them to move to a GUI system at that time. I know that Roy Folk did focus groups in market research for VisiOn, and he was very confident that the market was there, but I think his focus groups were early adopters.

Haigh: When the early product was tried out on users, was its slowness an issue?

Fylstra: Yes, definitely. I think there were several factors. The slowness was a big part of it. Also, the expense of the machine that you would have to buy to use it—the \$7,500 total

package price—was high. The market, when choosing between what I'm calling a better version of conventional technology and this totally new technology, which was still on the bleeding edge, made the choice that markets make.

Haigh: In terms of pricing, you think \$7,500 was too much for VisiOn. Do you think you could have gotten more than \$150 for VisiCalc?

Fylstra: Oh, yes. In fact, a brief story on that is that going all the way back to the West Coast Computer Faire where we previewed VisiCalc, one of the purposes of that preview was a private preview for dealers and other interested parties. We were asking people about pricing, and we got a number of data points that ranged from about \$35 all the way up to \$400. Most of them were under \$100, so we picked the highest price we thought was viable, which was \$99. Before long, we raised it to \$150 and then \$200, and I think there was a short time when it was \$250. We adjusted the pricing as fast as we could. It was undoubtedly underpriced.

Conclusion

Haigh: Unfortunately, we do have to stop, but I would like to ask a last question. What do you think was the single best idea or accomplishment that you had over the course of your career? In your heart, what is the single thing you're proudest of?

Fylstra: It's still under wraps. It's still to come. It's in the future. I keep talking about being so oriented toward the future. I'm full of ideas. But I think you'd like me to answer that question with what's transpired so far. There, I would just point to taking the first piece of original and promising software and making it successful as a business, delivering it to the market, reaching the market, turning it into the whole product. That's what I would be proudest of.

Haigh: I think we have to stop now. Thank you very much.

Editor's Note

Dan Fylstra provided Thomas Haigh with various materials to provide greater depth in describing his business history. One of these documents is a white paper that Fylstra distributed in advance for a PC Software Conference held on May 6, 2004 in Needham, Massachusetts, which was sponsored by the Software History Center [now the Software Industry SIG]. That document, "The Creation and Destruction of VisiCalc," is available on the Computer History Museum website as a Personal Account in the oral history section.

