Oral History of David K. Lam

Interviewed by:
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Craig Addison: David, can you tell us something about your background in the semiconductor industry prior to forming Lam Research?

David K. Lam: I cut my teeth at TI. Right after I finished my graduate studies I joined Texas Instruments and went to Dallas. In those days the industry was using 2-inch wafers primarily, just beginning to move into 3-inch. I was arriving in early 1974 with a great deal of excitement because the company was just starting its first line [in 3-inch]. Half of my job was involved in the fab, particularly in increasing the yield of the new 3-inch line, and in charge of certain segments of the fabrication process. The other part of my time was involved in the team that was designing and building semiconductor equipment, specifically plasma etchers [for its own use]. And those were the first generation plasma etchers in the industry. I ended up in 1976 in Palo Alto, California, joining Hewlett Packard. I worked in one of the HP labs, called the Integrated Circuits Processing Lab, where I was involved in pilot-scale production of HP's calculator chips. At the same time, I was asked to head up a project to build a highly automated plasma etcher, again for HP's internal use. That's how I got to be more involved in the technology of plasma etching for semiconductor fab use.

One of the things I found very interesting [was that] at TI I learned how production systems are viewed by the managers. They in general really wanted something that was very dependable, very reproducable. Later on, my understanding of their needs, of their requirements, became very important for me to launch Lam Research. HP was a little bit different. At HP what I learned most, among other things from my very enjoyable experience there, was the importance of automation. I was asked to head up a team that built a third generation system using a computer to control everything, so I came to appreciate the role of computer control and automation in the equipment. Later when I started Lam, I used the same concept, but with a different kind of processor.

Addison: Back in those days, when TI and HP built their own equipment, where there many dedicated equipment companies?

Lam: In the 1970s there were the beginnings of a few. Still, we were coming out of an era when the chip companies built their own equipment. They saw that as their competitive advantage. They didn't want to give that up because they wanted to be a little ahead of their competitors. Only in the 1970s did they begin to realize their core competencies were really in making chips, not making equipment. So step by step they were able to let go of the equipment building business and let other people do it and that is really the emergence of the semiconductor (equipment) industry.

Addison: Where did you get your entrepreneurial spark, when you thought about taking an idea and doing it yourself?

Lam: I think part of it was probably in my genes. My father was an entrepreneur himself and I might have picked up something from him. But more specifically related to Lam Research: It was during my years at HP, I saw the industry was beginning to hit a brick wall in terms of its ability to drive to smaller and smaller geometries in integrated circuits. By 1979, the industry was beginning to move below 5 microns. Today we are talking about a small fraction of a micron in terms of feature size. In those days it was several microns. They were moving to 64K dynamic RAM. We are talking about megabits, gigabits (now). In

those days 64K was a major challenge. They needed plasma etching to replace the liquid chemical etching that had been in use for some time. So that was really one of the main driving forces.

Let me also point out that plasma etching had been in existence for over 10 years before I even started Lam Research. It had been widely discussed in literature. There were many, many scientists [in this field]. I was one of them – but one who was involved in developing the technology for practical use. By the end of the 1970s, the market need, the customer needs, became very clear. And yet there was no really good production equipment for the fab managers to depend on. So that is really the opportunity for Lam Research.

I might point out one thing. When I first started, I met one of the people who later invested in the company, David Arscott. He in turn introduced me to Bob Noyce because he wanted to see if Bob Noyce would think my business plan made sense. So, after Bob had a chance to look at my business plan, I went in with David [Arscott] to see Bob. He gave me two thumbs up, and the green light. As a result of that, I was able to raise the money I needed to launch Lam Research.

Addison: That's a very powerful endorsement coming from Bob Noyce.

Lam: Yes, a very powerful endorsement indeed.

Addison: So did Intel become a customer?

Lam: Later on yes, they did. But they did a lot of due diligence on the [product] performance, not just because of Bob [Noyce]. Bob was more in terms of reviewing the business plan to see if that made sense as a business, whether it was worthy of investment.

Addison: Talking more about the formation of Lam, were there a lot of equipment start ups at that time, and was it difficult to get funding?

Lam: There were not as many equipment start ups as there are today. Funding was not plentiful. But I was fortunate that I started the company in 1980, which was a year and a half after [the United States] Congress passed a law to reduce capital gains tax. As a result, that was the beginning of the growth of the venture capital industry. I was right at the time going out to raise money. But some of the [venture capital] funds I was involved with were still in the process of forming themselves. And that is very different from today.

Addison: Were there other people involved in the formation of Lam Research?

Lam: I was the sole founder of Lam Research. When I came out of HP I came up with the idea of building the next generation plasma etcher for production use. But I was very fortunate to have met up with and recruited some great talent into Lam Research, including George Koch, Steve Muto, Tom Voehl, and many others in the early days.

Addison: Did they come from the device community?

Lam: George Koch came from Applied Materials; Steve Muto came from HP where I used to work.

Addison: Was there much competition in plasma etching at that time?

Lam: Yes, there was a lot of competition. Not only were there existing companies that were well established, but also new start-up companies, notably Drytek which was started by Art Zafiropoulo. These are all great companies and they have been veterans in the industry. So the field was actually quite competitive.

Addison: Was there anything you had that was a competitive advantage, in terms of technology, business, or people?

Lam: There are probably a few things. Drytek and the others also build great equipment. The biggest one probably was Perkin Elmer. Right around that time Applied [Materials] also got into plasma etching. We had big companies and smaller companies. My approach was a little bit different. From my experience working in the fab and the experience in building early generations of plasma etching systems and of course in my research prior to that, I came to the conclusion that it would actually be better if you can process the wafers one at a time. That was the beginning of the single wafer etcher concept. I was not the one who [first] did that. In fact, Tegal was probably the first to pioneer the concept of one wafer at a time, but it was more from the standpoint of doing R&D as opposed to doing production. My approach was to provide the best controlled environment in which etching takes place. For that reason, not only do you do one wafer at a time, you have to provide – very importantly – load locks to isolate the wafer from the environment, from the ambient. By doing that, you minimize contamination by particles or moisture in the air, or oxygen. All of those are very important. So that is one thing that I did a little bit different. Drytek did single wafers too; I was not the only one. But I emphasized a lot on contamination control and reproducible environment. I [also] did two other things that may perhaps be helpful looking back. One was the high degree of automation. I tried to introduce a microprocessor to control the entire equipment. By doing that, we did away with all the analog controls, all the dials and switches. Everything was displayed on the screen for the first time in the industry. We also were able to store the recipe in a little module we called process recipe module, about the size of a pack of cigarettes. It stores the optimized conditions worked out by the engineers. So the operators who are typically not engineers could not accidentally change the conditions or change the conditions without authorization. And the engineers would have a lot better control in setting the conditions for the process. The third item was using the modem for remote diagnostics. We were the first to use that [communication device] in support of the customers. These all combined to make the equipment a little bit more friendly to use, more reproducible, and more acceptable to fab managers who have the responsibility of producing the chips in a reliable and repeatable way.

If I may add one thing along those lines, on a strategic level, not an equipment level. In those days, there were three kinds of materials that plasma etching was going after: polysilicon, silicon oxide, and aluminum. All three were very important materials used everyday in making integrated circuits. The difference is that polysilicon was the easiest to etch. Oxide was more difficult. And aluminum in those days was extremely difficult because those were the early days when we tried to solve the problem of aluminum etching. When I built the first system I looked at all three of them, and I came to the conclusion that because the system is brand new, there will be a lot of problems no matter how hard we try and do a good job. So I will choose the process that's the easiest one so that it will be "easier" for us to have some

measurable success – maybe a smaller success – but some success in producing a system that can do the job of polysilicon etching. There were people in the industry that would be against that. Because they would feel that poly is so easy to do, probably other systems can do it: Why do you have to attack that particular problem when someone else appears to have already solved it? But they have not really solved it in a repeatable fashion. I thought I had the opportunity to contribute to that. That strategic move allows me to come out very quickly with a marketable product. Once I have done that I've earned some credibility in the marketplace. The customers who liked the first system for poly etching gave me the time to develop the second one which was oxide etching, and the third one which was aluminum etching.

If I was to do the opposite, I would be struggling not only with the first piece of equipment but also with a very challenging process, and the end result is that I would be delayed again and again in bringing out a very satisfactory product. So I attribute Lam's early acceptance in the marketplace to that particular strategic thinking.

Addison: In general, was there market acceptance for your products or was it an uphill struggle?

Lam: Well, it has always been a struggle. It was never really easy because customers are very tough, always. They look at a system very carefully. In the end I was able to sell [the product] pretty much by myself with a bit of beginners luck, one to each of the large customers [such as] Intel, National Semiconductor, AMD, and on the east coast I was trying to sell it to IBM. The interesting thing was this: the initial system that was sold would take months to evaluate, even though the customers said they liked it. Back in the 1981-82 timeframe when I first launched the product, the Unites States was still in a recession and the [customer's capital] budget was extremely tight. For that reason, plus being a new company and selling a new product that needs time to go through the process of evaluation, there was a period of time when there were no sales. Later on, I think Geoffrey Moore came up with the book talking about "crossing the chasm". But, at the time I didn't know I was crossing the "chasm", and I was waiting for the orders to come in, in a linear fashion: If the first one is good, they ought to buy the second, third and fourth. And that was not the case. I was a little bit disappointed that it did not happen. Only some years later did I learn this was the natural process of launching new products. Even though initially it was successful, that was a blip of success. Then there was a quiet period. I was really tearing my hair out to figure out why it didn't happen. But luckily for Lam Research the product checked out well, according to the customers, and the recession ended in late 1982. I was able to cross the chasm and be accepted by the market in general. The sales took off in a major way in 1983. Lam did a significant mezzanine financing in the summer of 1983, and went public in 1984.

Addison: What was your pricing strategy for the first etcher?

Lam: When I introduced the product at that time I was struggling with the price: How much do you charge the customer for it? I had already got the feeling I should not charge [based on] how much it costs, but how much it is worth to the customer. And at that time one of our competitors was charging $35,000 for a desktop model. Another competitor was charging $45,000 to $50,000, a bigger standalone. I was bold enough to charge $160,000 because I really felt what we had built into the system [was worthwhile], whether it was high reliability, the double load locks, the electronic control, the digital control, the smaller footprint, and of course most importantly, it would do the job you would expect it to do. With all of those combined, I thought it would be worth about $160,000. I thought I was incredibly bold until Applied

Materials announced their price which topped me. But today an etcher can be sold for somewhere between $2 and $3 million. And when you are talking about big bucks, the customer doesn't want you to be just fooling around. They want you to be really serious because they are spending really a large amount of money to buy new equipment.

Addison: What price did Applied charge for its etcher?

Lam: It was over $200,000, I forgot the [exact] amount now.

Addison: In your view, which product was the superior?

Lam: They were different. Ours was a single wafer; Applied's was a batch system. I had decided from the marketing standpoint to concede the batch market to Applied. I was willing to do that. But I really wanted to corner the single wafer market for ourselves, if that was possible.

Addison: Did you come up with the pricing yourself, or have a meeting to discuss it?

Lam: No you can't, those meetings are not terribly useful. I think I must have talked to potential customers and I tested their reaction. As a result, I was able to nail it down to a small range and came up with a price. In fact, I remember it was just before I was being interviewed by a trade magazine, and I knew that was one of the questions that would come up. So I had to come up with a number, and I knew I would get stuck with it once they announced it (in the press). So it was pretty scary in a way. I didn't want to price it too low, and I didn't want to price it too high.

Addison: In retrospect, was it a good price?

Lam: I thought it was a good price because we enjoyed a very good margin for years. And of course in this industry, as you add more advanced capabilities you can price it higher. It worked out very well.

Addison: During that period until you went public, did you only have the one product?

Lam: At that time we were already introducing the second one, and probably working on the third, which is aluminum. It's still one family of products. Getting market acceptance, getting the key players to buy our product against the toughest competitors such as Applied, Perkin-Elmer, Drytek and others, was really not an easy task. We did have a family of products, but the first one or two were being introduced and some more were being worked on.

Addison: Can you talk a little bit about the competitive landscape at the time. I guess back then Applied was not the giant it is now, so was Perkin-Elmer the competitor everybody feared?

Lam: This is how I looked at it. In 1981 and most of '82, we had zero revenue, and Applied had $50 million in annual sales. I find that 50 divided by zero is still infinity. So they may be small but in my eyes they were huge and they were tough competitors regardless. The interesting thing was that I found out that in the world there were basically two major markets, the U.S. and Japan. There was very little going

on in Europe or in Asia outside of Japan at that time. This is going back to the early 80s, before the first foundry was formed.

I decided that we had to get into Japan. So I took quite a while to negotiate with Tokyo Electron to get that done. In fact, before I selected Tokyo Electron I consulted with some friends of mine, Bill Bottoms of Varian, Ken Schroeder of KLA. We were all going to Japan to the [SEMICON] shows and I got to know them and asked them how they launched their product, who their partners were, and how they worked with them. I finally decided that Tokyo Electron was a good partner for Lam to launch our product in the Japanese market. So that's how we came together.

Addison: Was Akira Inoue the head of TEL at that time?

Lam: Akira Inoue was the one who negotiated with me. He was in charge of the equipment division, which was the largest and fastest growing division in TEL. As you know, he later on became the head of all of Tokyo Electron. He was the one who worked most closely with me.

Addison: SEMI of course has the Akira Inoue Award for EHS contributions to the industry. In your dealings with Inoue-san, what was your impression of him?

Lam: A very smart guy, a very good executive. I dealt mostly with him rather than the [TEL] CEO because he was in charge of all the semiconductor equipment. I worked with him a lot on both strategic issues and tactical issues in the early days. I worked very well with him for a number of years. I met him in 1982. He came [to the U.S.] after a full year of negotiations, primarily led by the local executive, Sam Kano. But in May '82 Inoue-san came to the U.S. to attend SEMICON, and he came early and stopped at Lam Research where we essentially finished all the key items on the relationship. And we had a handshake across the table, and that was the beginning of the relationship to form a marketing partnership.

Addison: Was TEL only a distributor at that time, or did they have any of their own products?

Lam: First of all, it was no secret that Japanese chipmakers were very nervous buying equipment from a small company from California. They were just not used to dealing with small companies, let alone dealing with a small company so far away. We had no credibility in selling into that market. At the same time we knew that TEL had a product. TEL's product was something that I think was made in England. From what I understood it was not very reliable at that time. One of my staff, I think Bob Redstone, suggested I contact TEL's local [U.S.-based] executive, Sam Kano. So I decided to call him. Sam basically told me that he was not interested. That was the first conversation. [He said,] "We already have a product we are representing in Japan, and when we form a relationship with vendors we don't change every time something else comes up." I thought about that, but just didn't want to give up. So I kept explaining why we were different. Sam finally had to get rid of me, so he agreed to come over and visit me in Santa Clara, not too far from his office. Well, the moment he looked at it he realized it was a very, very different design concept and a different way of doing plasma etching. He was very intrigued. So we agreed to have a group of engineers coming from TEL to look at the equipment. At that time, frankly, some of my staff was very much against it because they were concerned about opening up the system to somebody who may or may not work with us. But I felt we needed to take some calculated risk. So I agreed to that. The first group of engineers came in. They were not process engineers. They were not

chip engineers. They were field support and maintenance engineers. The reason was that the system had to be very reliably built, very robust to minimize the cost later on of supporting the customer to whom you had sold the system. They went back to Japan after the visit and wrote a glowing report on us. One thing led to another, and a year later after the first conversation [with Sam Kano], we formed the agreement for TEL to market Lam's product in Japan.

Addison: Didn't you end up forming a joint venture in Japan?

Lam: In those days, you could still continue on with a distributor for some time. But we were told that chipmakers tended to be more willing to buy equipment if you had a commitment in Japan, particularly if you had a manufacturing operation there to implement the changes that may be more suitable for the Japanese market, and may or may not be suitable for the U.S. market. So we later on decided to form a joint venture with TEL to make the equipment for the market in Japan.

Addison: From the point of view of economies of scale, was it a cost burden to set up manufacturing in Japan as well as the U.S.?

Lam: In our relationship with TEL, they would do most of the investment in the manufacturing operation. The joint venture, of which Lam owned 50 percent, was managed by Japanese nationals. So we would transfer the manufacturing knowhow and they would invest in the manufacturing operation.

Addison: What was the end result of all this, did you have good success in Japan?

Lam: Because of the TEL relationship we were able to sell a lot of equipment in Japan. As I mentioned earlier, there were only two markets in those days, the U.S. and Japan. And Japan was practically 50 percent of the world market then. It was a market we couldn't afford not to be in. It was very important for us to be there. It was at times a difficult relationship. Because of the distance, the language barrier, as well as some specific requirements from the Japanese IC makers, it makes it a little bit more challenging to overcome the problems. But we did overcome most of the problems and became one of the major players in plasma etching. Mind you, there were Japanese manufactures of etching systems, too, with some producing single wafer systems. They were selling against us and they had the advantage of being an indigenous company. But because we were teaming up with one of the largest players, we were able to sell quite successfully in the 1980s.

Addison: Going back to the formation of Lam, where did you get the initial funding from?

Lam: Interesting that you ask. My mother was the first investor. In fact, when I showed her the business plan after she decided to put a small amount of her savings into the company, she said, "What is that?" I said, "It's the business plan." She said, "I don't need to read it, and I don't read English." After that, some of my siblings also joined in. But of course the bulk of the investment, not only the first round but also subsequent rounds, all came from venture capital investors.

Initially I had two smaller [venture capital] firms, which are no longer active, and they were joined by Mayfield, and Hambrecht & Quist. Those became the largest investors in Lam. H&Q also did the

mezzanine financing. And later on when we were ready to go public, they [H&Q] were co-underwriters along with Goldman Sachs in 1984.

Addison: When you went out to raise the money, was it difficult? When you showed people the business plan did they accept it straight away, or did you get a lot of rejections?

Lam: Well, I certainly had my share of rejections, partly because some people felt there were too many plasma etching companies around. Others found it a little more difficult to understand the technology to appreciate the opportunity. And there were also those who felt that I was really a technologist, not the best person to start a company. All of that got entered into the equation. But in the end, I was able to persuade some investors for the first round. Once we had started to build up the team and develop the product, we were actually able to get the product out in one year, way ahead of schedule. We missed [securing a booth at] the SEMICON West show in 1981, because we didn't think we were ready, but we managed to get a hotel room with a suite and do some presentations and at least be part of SEMICON in 1981.

Addison: Were there many other start-ups vying for VC funding then?

Lam: There were quite a few (start-ups). In the 1981 timeframe in venture capital, many of the new firms were coming into existence, because of the lower capital gains tax that spurred the growth of the venture capital industry. In some ways it was a little bit easier [for me] because there was new money available. But the size of the pool was much smaller than it is today. The semiconductor industry was perceived as an emerging industry, an emerging market, so there was a certain amount of excitement around the companies being formed in that market.

Addison: Was there anything special about the IPO you can remember?

Lam: The timing was kind of interesting. We came back in the summer of 1983, from a mezzanine round of financing, primarily in Europe. We raised $10 million and we came back in about July or August (1983), sometime in late summer. In any case, we thought we were not going to go public for a little while. However, we proceeded to select the underwriter, and Goldman Sachs was the one we had selected. Then came early '84. The Goldman Sachs partner came to visit and informed us that according to their model, the IPO window might be closed later in the year. So they advised us to consider going public sooner rather than later.

We literally hadn't even touched the $10 million we raised a few months ago. So we were wondering what we should do. But in the end we decided to take their advice and chose to get on the road again early in 1984. It turns out they were right: the IPO windows were closed later in 1984 – and closed for several years after that.

Addison: Looking back, what are some of the highlights you remember?

Lam: A highlight was probably the first purchase order. You work so hard to create a product and you show it to the customer. It is very rewarding knowing that someone in the marketplace has recognized

what this can be used for and is willing to pay for it. This is a company milestone, and for that I was extremely proud and very happy.

Addison: Who gave you the first order?

Lam: It was from a company called Trilogy, a new company itself, founded by Gene Amdahl of Amdahl Computer fame. Even though later on they didn't do very well, they were among the first that bought our system. And of course later on the more established semiconductor companies [bought] as well.

Addison: Who was the biggest chipmaker of the time, the Intel of the day?

Lam: Probably Intel was still one of the biggest, but certainly very small by today's standards. National was also very large, and AMD. All three of them were vying to be the leaders in the semiconductor industry, certainly in the West Coast. In the East Coast, IBM and to a smaller extent [AT&T] Bell Labs which had its own semiconductor operation.

Addison: Did you eventually get orders from all of those companies?

Lam: Yes. But in the earlier days when I basically sold this system myself, [the customers] were those closer to Lam in Silicon Valley, and some of them I knew personally when I was working with other companies. They were a little bit more willing to test out the product, because they had known me, a little more willing to take some small risks. The companies in the East Coast, AT&T as well as IBM, they tended to be a little bit more conservative. They still came on board later on, but the early customers were all from the West Coast.

Addison: When did volume orders really start to come?

Lam: 1983 was the first year we had multiple orders, and partly because after one year of shipping evaluation systems, the customers became satisfied: This is the one product we want, if we are going to expand our fab production. Secondly, the recession ended in late '82. All of a sudden the [capital] budget became available. So '83 and '84 were two very good years. We happened to have the right timing for both fund raising in '83 and IPO the following year. For the first time I saw purchase orders coming in, ordering five or 10 systems. And they were ordering so fast we didn't have enough time to build up our manufacturing capacity. Some of the customers would have to wait for one year to get their system. Those were the highlights looking back, wonderful years, wonderful times.

Addison: Any disappointments you would like to talk about?

Lam: Yes, I touched on that a little bit earlier. After the initial spurt of sales, the purchase orders did not continue to come in. That was a major disappointment. I didn't understand the reason why. Looking back now, as I mentioned briefly earlier, there maybe three reasons. The most important one was that I was in the process of getting market acceptance of our new product – and Geoffrey Moore [later] coined the term "crossing the chasm". I was in the middle of that and I didn't know it. The second reason was perhaps the recession. 1980, '81 and '82 were tough recession years in the U.S. economy. Obviously any time when that happens capital budgets will be cut very severely. The third reason was perhaps I was

inexperienced in selling. I had some beginner's luck in selling the first few, but when you are really talking about building a sales organization and competing against the bigger companies, I was not as good in managing sales. Because of that I was very happy to have Roger Emerick come and join our company, complementing where I was weak and inexperienced. Later on, Roger would take on the company and move it forward. But this [disappointment] also led to a good outcome, when Roger joined Lam Research in 1983.

Addison: Was he hired to be the sales muscle?

Lam: He was hired to be the president of the company, but one of the great strengths he brought to the company was sales. He was a sales vice president in another company before.

Addison: How did you find him?

Lam: We used an executive search firm. And I met with a number of very strong candidates, some from the chip industry, and some from the equipment industry. Roger and I went out together in '83 to do the mezzanine financing, and we worked together to take the company public as well.

Addison: Can you tell me about your own manufacturing operation, did you build a greenfield site, or outsourced?

Lam: In the early 80s we did not outsource too much. Obviously some of the things we can't build. Big things like pumps, smaller things like flow meters and pressure gauges and things like that. But we built a lot of stuff. We bought the electronic [parts], but we built our [circuit] boards. We bought the pipes and tubings, but we did our own gas manifold. And things like that. Those were the earlier days when only a few of us considered outsourcing. It became more popular after the mid 1980s, perhaps more practiced by Bob Graham of Novellus. But other companies including Lam Research followed, reducing the size of the manufacturing operation, reducing headcount, and only building [in-house] the most critical parts where we have some intellectual property and some control.

Addison: Was the Japan factory similar to the one you had in the U.S.?

Lam: Very similar, but I think the Japanese have been more adherent to the vertical integration model. To them outsourcing was not as acceptable as it was with U.S. manufacturers. For years they were still building a lot of stuff for themselves. Only in recent years, in the last couple of years, did I see outsourcing becoming accepted by upper management in Japanese companies.

Addison: At what stage did you start to pull out from the company, and become less involved?

Lam: I continued to be involved after the public offering but over time I came to the conclusion that all the investors were happy about the outcome of their investment [in Lam], the company had a very strong management team and was doing very well, and my role would be a little bit less critical compared to the early days. So towards the end of the 1980s I began to slowly phase out both from operations and from the board. That was the time I conceived the idea of forming my own investment firm, David Lam Group.

Addison: Did you ever want to expand the company beyond etch?

Lam: Lam was doing very well building the business, focusing on plasma etching. The company did try to branch out into other things: epitaxial deposition, CVD. [But] the company didn't have much success in those areas. Sometimes when you try to do multiple things it has to be managed very carefully, even for the more established companies. You do need to have the core competency in the company to do that. If you are very large you can do a number of things, but if you are medium sized like Lam was, then I think you have to be a lot more careful how you want to branch out into other process technologies.

Addison: What have you been doing since you left Lam Research?

Lam: I started investing in some companies, did some turnarounds, did some mergers and acquisitions. And then over time I began to be more focused on working with technology companies, perhaps with a technology founder who may be very good in what they are doing, but can use some business advice to make the company that he or she founded more successful. That became my business model. So rather than just investing like a venture capitalist, I also go in and coach the management team, particularly the founder, and mentor them. I call myself a "mentor capitalist" as opposed to a venture capitalist.

Addison: Are these companies in the semiconductor equipment industry?

Lam: Some are…I probably have one third in the equipment business the other is in other fields.

Addison: That seems to be quite different from what you started out as. You called yourself a technologist in the early days, but now you are giving the business advice.

Lam: The way I look at it is this: There were times in the past when I was building Lam Research [that] I wish I had a good mentor who could advise me at different critical times. A company grows like a baby, like a person. The needs change as the person grows up. I was involved in "changing diapers" when the company was small. I saw the company learning to crawl, learning to stand up, and learning to walk and run. When they started to run, and started going to school I thought that my job was more or less done. In particular, I look at the IPO as the child getting married. They are really well set.

On the other hand when I look at other companies being formed by technologists in different fields, they are much smaller than I am, much more knowledgeable in that particular area, but I can still help them in building their business.

Addison: There is always a lot of talk about consolidation in the semiconductor equipment industry. Do you think it is more much more difficult now for somebody with an idea to come along and start a company like you did?

Lam: It would be perhaps a little bit more challenging. The strategy I used successfully in building Lam Research may have to be changed. For someone who is starting a company now, the industry is a lot more mature, and there are a lot more entrenched market leaders in each and every sector of the industry. So to be successful you really have to have some truly breakthrough technology in order to really get to the point where a customer will be willing to take a look at you. If it was just an evolutionary

improvement, it would be very difficult to break in. It can be done, but you would have to employ a different strategy to do that.

Addison: You mentioned that your first plasma etcher wasn't exhibited at SEMICON West 1981. Did you participate in the shows prior to that time?

Lam: In the 1970s, I had relatively little to do with SEMI since I was involved with HP at the time. HP was not actively involved in the semiconductor equipment field. But by the late 1970s, the industry was really coming into its own and the trade association SEMI was becoming a very significant organization. In the early days, I found that SEMI was a great organization, a great platform to help young companies launch their new products. Whether it is a technical presentation, whether it is going to the trade show to show your wares, or to attend and network in those three days [of the show]. All of that was tremendously useful, not just for the young companies to bring the products to market, but also for the user community to come and look at what is new.

I remember I was giving technical presentations in '82 and '83 at several places, SEMICON West, SEMICON Southwest and SEMICON Japan. Each and every time I was able to present the technical information that was relevant to our product without making it a sales pitch, which is not allowed in technical presentations. I think that was a great platform. And SEMI has done a great service to our industry.

END OF INTERVIEW

