

**INTERVIEW
MICHAEL CUSUMANO
SLOAN ORAL HISTORY SERIES
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M: Michael Cusumano

B: Robert (Bob) McKersie

G: George Roth

B: The logical place to start, Michael, is your coming to the Sloan School, the year and what attracted you to the Sloan School. How did you see yourself fitting in? Who were some of your colleagues? As I read your website, this happened after being across the river.

M: Right.

B: Two years at Harvard Business School. So that in itself will give us some other questions to ask. Why you chose us and how you saw this place as you entered it.

M: My route was a bit indirect. I was actually recruited to come to MIT by Dan Roos in the Engineering School. I had been a post-doc at Harvard in what's now the Technology and Operations Management Group. I had finished a PhD at Harvard two years before that, and I'd written a history of the Japanese automobile industry focusing on the development of manufacturing technology and some of the related issues – labor, organization, market, government policy regarding industry. Pretty broad style.

G: That's that big book.

M: That's the big book. *The Japanese Automobile Industry*.

G: I have one of those.

M: Which I think remains my most cited work to this day. That was essentially my doctoral thesis.

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G: What year?

M: 1985, Harvard University Press. I was a post-doc 1984-86. My first task as a post-doc was to refine some things in the thesis and then publish that book. I had a project writing about software factories, seeing if the Japanese were transporting any of their skills in production management and quality management to large-scale industrial software development. The post-doc program at Harvard at the time was intended to take PhDs from disciplines, train them in the business school, and try to seed the Business School faculty. You had to propose a project or capstone on your own project, and then haltime you worked with Harvard professors, either cases or for their own research. I started to finish my auto book and then started the software factory project. That was my time.

 For the time for Harvard, I mostly worked with Professor Richard Rosenblum looking at the development of the video recorder industry in Japan. We wrote a couple articles that actually became widely read in the technology management, technology strategy, and innovation fields.

 Meanwhile, I was at Harvard, and I was switching from automobiles to software as my main focus but very much interested in operations, innovation management, product development, production, and how they intersected with strategy. I was recruited to come here and join the International Motor Vehicle program. I wasn't really on the traditional business school market because I didn't come from a business school. Essentially I was just sitting over at Harvard waiting to see what would happen.

 There were some options to possibly stay at Harvard, but I was approached by a couple schools. One was Chicago and actually I was offered a job at Chicago Business School in the Operations Management Group. I liked Chicago but felt those guys were really operations research people, too mathematical for me, so I didn't really want to go there. But Roos was recruiting me to join the International Auto Vehicle program as a researcher and I said, "Well, I have an assistant professor job offer from Chicago, so I'm going to take that unless you can get me an equivalent offer at Sloan." He sent me to see Tom Magnanti in Management Science, as well as John Little in BPS, the two heads of these areas. We talked about whether there was any way I would fit in the School. It turned out the Strategy group had an opening and also the

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Innovation group potentially. I gave a job talk, which many people came to across the whole BPS floor. I don't know if you came to that, but since I had written a whole chapter on the labor issues that enabled the Japanese to institute their unique production management systems, I had actually met some of the IR faculty. I had come to one of your IR seminars before that time, while I was a post doc. So I knew some folks there. I didn't know the Strategy or Innovation people, had never even taught strategy. I came and gave a job talk.

I was essentially a BPS hire, which may be one reason why I have a different attachment or feeling about BPS. I gave a job talk, it was really for many groups within BPS and no one was quite sure what to do with me, but I was offered a job and told I would be half in Strategy and half in the Technology Innovation group. Ed Roberts was the group head in Innovation and Arnolando Hax was the group head in Strategy. I decided to take that job as an assistant professor and be 50/50 in those two groups. Even to this day, I teach one course that's an innovation course and one course that's strategy. That's always been my load split.

I joined in July, 1986. Sat through some of the strategy material that Harvard was teaching in Executive Ed to get a sense of what teaching strategy was about. I also sat through the first few weeks of the Sloan Fellows strategy class which Mel Horwitch was teaching at the time. Then I was told to build my own elective, which I did, and called it, "Japanese Technology Management," which I taught for five years.

B: You were also playing a role with Dan Roos in the MIT Motor Vehicle Program.

M: Yes. At that time I had moved away from manufacturing, but I did become one of the principal faculty in that program, mostly supervising students. The student who coined the term "lean production," John Krafcik. I was the supervisor of his Masters thesis. In many ways they took a lot of things I had looked at in the Toyota production system and abstracted and generalized them. John called it "lean" production largely because the Japanese were doing the same manufacturing operations with half the number of people in US plants. So I was very involved supervising students.

G: John never used "lean" in his Masters thesis.

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M: No, it came in an article afterward, and then he and I prepared companion articles. His was titled “The Triumph of the Lean Production System.” Mine was, “Manufacturing Innovations: Lessons from the Japanese Automobile Industry.” We published the companion articles in the Fall 1988 *Sloan Management Review*. But by then, I was on to study software and look at product development in the automobile industry. I did another book on automobiles in 1998 on auto product development with a former doctoral and MBA student, Kentaro Nobeoka.

So we have Dan Roos to thank. Dan has remained a close friend and mentor to this day. He just retired roughly a year ago.

B: I was at the retirement party.

M: Yeah. I was at that party too.

B: Going back to this split between strategy and innovation, are there weekly seminars? Or how do people in these different areas... see, I'm so biased toward the situation where we always had this Tuesday seminar where the faculty and PhD students had at least a weekly event where you're interacting with your colleagues. How does that happen in Strategy and Innovation?

M: When I first came, the Strategy group didn't actually have a seminar. Again, it was quite complicated. I've always has this complicated set of relationships with groups. I was half Strategy, half Innovation, but I was also matrixed into the International Management Group, which had Eleanor Westney, who was also a Japan specialist. I had known Eleanor before I came here. I had met her and knew her work quite well. I was also matrixed into the IT group because I was studying software development. It was very complicated the first year. I would go to CISR meetings and the IT research seminars. I was quite close to some of those folks and actually have continued close relationships with the IT folks even to this day. I'm a member and was one of the faculty who was there at the beginning of the Center for Digital Business in 1998 or so. That was founded by Glen Urban and Eric Brynjolfsson. So I've had these multiple streams. But Strategy didn't have its own seminar; the Innovation group didn't have its own seminar. Then International merged with Strategy maybe a year or two after I got here. When that merger took

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place, we set up a weekly seminar, the Strategy and International Management seminar, SIM we used to call it. When you had bit more critical mass of faculty and students, you could do a seminar. That went on for quite a few years.

The Innovation folks did not have a group seminar. We did establish a research center called ICRMOT, International Center for Research on Management of Technology. When that center was set up, I guess it was early 1990s, that center did have a monthly seminar. It wasn't necessarily research. They would sometimes bring practitioners in, but that was one mechanism.

B: Because there were sponsoring companies, I remember, for ICRMOT. So you had to relate to the funding sources.

M: Again, Glen Urban was involved in that. I was on that steering committee for a while, so we had that mechanism for bringing people together. But the Innovation group was still relatively small and mostly informal the way we coordinated. IT was more structured.

If I have one regret, it's that I never developed any real colleagues for research here at MIT. The only faculty member at MIT that I ever wrote a paper with (and we've written several) is Chris Kemerer, who was in the IT group. We both worked on software development and project management.

One of the issues I faced is that I was not really a strategy researcher. My work was always much closer to operations or technology management, so intellectually I always felt closer to the Innovation group, although a lot of the guys in Strategy were what I used to call Ops Management "retreads." Arnoldo Hax came from Operations Management. Ned Bowman came from Operations Management. Mel Horwitch had been in the Ops Management Group at Harvard. I came from the Ops Management Group at Harvard as well. Michael Scott Morton came from Management Science. Rebecca Henderson was hired in 1988. She had also been in the Technology and Ops Management group at Harvard, as well as Business Economics. I had known her as a grad student. So we always had this strong core of people in strategy interested in technology and operations and planning, related to those issues.

In any case, the tradition in the Innovation group was people pretty much worked on their own stuff and distinguished their individual careers. Ed Roberts was very different from

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Tom Allen. They were very different from Eric von Hippel. They were the “Three Musketeers” who were the core of that group when I got here. Jim Utterback came in later. He was in the engineering school at that time but didn’t have an appointment at Sloan until sometime in the 1990s, maybe 1990-91 or so.

Intellectually I was much more interested in information technology and software. I still worked on product development topics in automobiles with my PhD students. I had money from the International Motor Vehicle Program to give some doctoral fellowships. I think I had three or four Japanese students who did PhDs under me: Akira Takeishi, Yaichi Aoshima, and Kentaro Nobeoka, at Sloan, and then Toshihiro Nishiguchi, who was a research at IMVP completing his doctorate for Oxford. Then a bunch of master’s students whom we had funding for, led by John Krafcik.

B: So you really had a project there with funding.

M: It was a great project, culminating in *The Machine that Changed the World* book, but we kept at it with a couple other books. Later on I was co-director of the program with John Paul McDuffy for several years, and then I passed that on to Charlie Fine.

B: You’ve done remarkable work here. You were interested in Japanese automobiles, and then you mentioned semiconductors. How did you get interested in a particular project that then engages you? A book ultimately was the product, isn’t it? You did do some shorter articles. You mentioned Chris Kemerer.

M: Yeah, I think I have nine books at this point.

B: How do you explain the selection of a topic?

M: I’ve had a number of criteria, actually. They’ve been fairly explicit. I was definitely drawn to technology management kinds of topics. I’m one of these people, if I had to do it over again, I might have been an engineer. But I certainly would have studied much more

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engineering and science. I studied a fair amount, studied a lot of history of technology, and had an early introduction to computers in college and graduate school, but gravitated toward history.

Then I ended up in Japan for two years and learned Japanese. This was somewhat of a quirk of fate. I had actually majored in history as an undergraduate, history of ideas was my sub-topic at Princeton. History of science was part of that, but I didn't have the technical background to do a PhD in history of science. I actually inquired. So I applied to regular History Departments, was admitted to Berkeley, but the fellow I wanted to study with took a two-year leave, so I had a couple years to kill. A couple of undergraduate classmate friends were doing Asian studies, Japanese studies, and Chinese studies. This was 1975. It occurred to me that what they were doing was far more interesting than what I was doing. I had been studying the Enlightenment in Europe and why it didn't take hold in Spain. I actually had learned Spanish. I always liked to leverage my language skills. My undergraduate thesis was on problems with Spanish development. Japan was really intriguing at that time, and Princeton had this program, "Princeton in Asia," where they gave you a position at a university teaching English for two years, and you could make a deal and study language. So that sounded pretty interesting to do for a couple years before I actually went to do a PhD. I had admission to Berkeley and I didn't quite know what I would do.

Turned out I went to Japan, I made this deal to study Japanese intensively for two years. Ended up doing the equivalent of at least a four-year curriculum in undergraduate Japanese. While I was there, I became interested in comparative history and Japanese development, and the best place to do that was Harvard. They had a professor there who had written specifically about Japanese historical development in science and technology, modernization. His name was Albert Craig. I ended up going to Harvard and doing this PhD in a joint program between history and east languages and civilizations.

While I was in that program, I had to write some papers. The first paper I wrote on technology entrepreneurship was in that program. It was the equivalent of a second-year paper at Sloan, and that was on a Tokyo University professor who had spawned this bunch of different companies. The best-known company today is Ricoh, the copier and optics company. That was my first paper, which was published in a book. Then in choosing the doctoral thesis topic, I wanted a bigger topic that hadn't really been studied thoroughly yet. I like to choose topics that are very important and sort of rising in importance, so by the time I got done with it, it

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would be more important. I wouldn't have to be explaining why did I study the failure of Spain to modernize. I'd rather be explaining more important phenomena that related again to technology and could leverage my skills as a historian interested in technology and science where I did have some training at Princeton, and also the language skills I had acquired. I had acquired good enough skills (I have actually a joint PhD in languages) so I can actually read and write Japanese, do work in Japanese.

In talking with one of the visiting professors at Harvard, we identified this area of technology-based entrepreneurship. He turned me on to this. His name was Nakamura Masanori, a professor at Hitotsubashi University, at the time a historian. That's where my first technical paper came on high-tech entrepreneurship in Japan. It seemed no one had really delved into the automobile industry and described where it came from. In the late 1970s, Japan was just about to become the world's largest automobile producing nation. That happened in 1980. So when I started that research in 1979, there was rising importance, and a lot of mystery as to where Japan got these skills from. It seemed like a good base for me to look historically. I went back to the beginning of the industry in the 1930s and tried to understand the origins of these companies, where their technical skills came from, the role of the government, the role of labor, and technology transfer. So that was the doctoral thesis. I also got a couple Fulbright fellowships and some funding from Harvard to spend more than three years at Tokyo University.

So it was very natural, when I was done with that study, for business schools to be interested, particularly at Harvard, which had a number of people studying the automobile industry at that time. I was actually hired first to be a post doc for William Abernathy to study product development in the automobile industry, but he died before I got there.

B: Is that right?

M: He died around New Years Day of 1984, and I was scheduled to start on July 1. So Harvard quickly scrambled and put together a meeting between me and Kim Clark and Dick Rosenbloom, and they scoped out my time. Kim offered to help me get my auto book together to be published, and gave me some advice on how to do some of the calculations and data manipulations I wanted to do, calculating productivity and things like that. Rosenbloom had ten years of materials on the video recorder industry. He was drowning in it. He said, "I need a

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historian who reads Japanese to go through these materials.” I was also co-supervised by Jai Jaikumar. I spent about a month in Japan with him, going to machine tool companies, understanding flexible manufacturing. It’s the sort of work I still leverage today. Learned a lot from Jai on how to analyze a factory or a production process.

B: To give you a brief break. You know the format of the dorms at HBS, they’re called can groups. Dick Rosenbloom and I were in the same MBA Class of ’56. He stayed on to get his doctorate there. He had come directly from Harvard College and in those days you didn’t necessarily have to have any experience.

M: He was a chemistry major.

B: Yes, he graduated from Harvard in 1954 and went right into the MBA program. He and another guy from Harvard were in the same can group. So we were in the same section, section A, of the Class of 1956. They had a very popular course, when I was there as an MBA, called “Advanced Production Problems.” They would take different industries and get to the state-of-the-art of that industry in terms of technology and innovation. Dick must have done his thesis in that area and he stayed on. I don’t think he ever really left.

M: He became an instructor and then a regular faculty member. He was very much interested in infrastructure policy in those days, too.

B: Bright guy, really terrific. This is a real aside. During the 1960s, when all kinds of civil rights issues were blossoming, Dick got a grant from some Washington agency—I don’t know whether it was the SBA or Dept. of Commerce—to set up training programs in different cities where there were budding black entrepreneurs. He involved me in one of the seminars, which we ran. I forget which city it was. But Dick was there, innovating, a subject very different from what he’d been working on. But here it was, the 1960s, and the need to help black business, and Dick was at the forefront.

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M: One of his doctoral students later on was Bill Adams. Dick was his supervisor, so that was part of the legacy.

B: Dick must have died about three to four years ago now?

M: Yeah, three years ago.

B: He went to NY City to live at the end.

M: Right. He got remarried. I kept in touch with Dick. I had him out to my house. I even wrote his biography for the Strategic Management Encyclopedia.

It's hard to overestimate how much I actually learned from those guys. Kim Clark, Dick Rosenbloom, Jai Jaikumar, and also Bill Abernathy at some level. I had gotten to know his work very closely and a lot of it is centered around data, but real problems, real managers, real companies.

My work and my sensibilities very much fit with the Harvard Business School philosophy. But the fact that I was also trained as a Harvard historian, and trained at Princeton, meant that I really like to get deep into phenomena and details. That also fit quite well at MIT.

My doctoral thesis has a lot of quantitative data. I had always wanted to collect lots of data. Production data, productivity data, investment data. But I didn't know how to use statistics. I had taken one statistics class in college but it wasn't really enough to do the kind of work that business school faculty or doctoral students do. Harvard was a bit of a mix, particularly in that group. You had some very qualitative people, like Dick Rosenbloom, who are very much like historians. Then others, like Kim Clark, who collect data as economists, but what they do is not all that complicated. Then you had Operations Research folks. They were all in one group, which we separate at Sloan into three separate groups.

One challenge I did learn is that it's useful in a business school to expand your methods and that some problems just cry out for being analyzed with data, statistics, regressions, and more sophisticated methods. Other problems cry out for detailed, deep, ethnographic research. I had to learn some other methods when I got here, but mostly that's how I partnered with Chris Kemerer, for example. He had a whole bunch of econometric skills, and I really

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wanted to understand differences in productivity between software projects managed in the Japanese style versus American style. To do that, I needed someone with his skills. I continued to partner with my doctoral students, and some other researchers like Chris, for some of these kinds of problems. So I added that to my portfolio of research that I didn't have the training for.

B: Help me understand. There's this term "cliometrics." Is that...?

M: Cliometrics? Never heard of it.

G: I confess the same. Where and what context did you hear about it?

B: I thought it was historians who were very quantitative.

M: Never heard of it. We've always had quantitative history as a field. Those guys are usually economists or economic historians. They're historians in Economics departments. I didn't have that kind of training. I actually trained more in Japanese studies. I had a field in history but I read some of that material and saw how people were using data. So I do a lot of work that is mixed.

G: What's really interesting about your career is your ability to bridge and work in different groups. I'm guessing that it hasn't come up. People have talked about that opportunity as one of the things that's attracted them to MIT but you have literally lived out your career by bridging those fields. Was that something you saw when you came here, that that was possible? You couldn't possibly have known. I guess it was Roos' offer and then providing the faculty appointment.

M: That is part of the beauty of the BPS (Behavioral and Policy Science) area in some ways, but also just the flexibility across Sloan and MIT more broadly. For me, from Day One, I worked closely or interacted closely with people in the Engineering School, not so much in terms of doing research, but more as colleagues. Later on, I took an appointment in

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engineering systems as well. I never really worried about which group I was in because I was told on Day One, “Don’t worry about it.” That’s not the advice I think we give to most faculty.

G: Who told you that on Day One?

M: Basically I was told that by John Little. In my hiring meeting, I can still remember it. There were just two people there, one was the Deputy Dean, Al Silk and the other was John Little as the BPS area head. I was not in a meeting with the group heads of innovation or strategy, Ed Roberts or Arnaldo Hax. As a matter of fact, I heard they were fighting over me. Each of them wanted me to be 100% appointment in their group and that resulted in the solution of dividing me. With those kinds of appointments, you always worry about falling in between the cracks if neither group supports you fully.

I was also interested in other areas, operations, and more so IT. But the advice I got was: “If you do really good work, we’ll figure it out.” It’s good to have people fighting over you rather than saying, “Who wants this guy?”

G: Or “Who’s going to take the other half?”

M: Right. I never really worried about it. I was always at the interface, and Sloan was flexible enough to have someone like me at the interface. My research interests and my interest in management comes from my father, by the way, who was a business person. I grew up listening to him and learning from him and working in the stores that he supervised. He worked for Bostonian Shoe Company, and for five years I worked in his stores as a summer replacement for either salesmen or managers. I was managing stores in NY City as an 18 or 19-year-old college student.

Harvard has a lot of these silos and they have trouble across them, whereas Sloan seemed quite flexible. I still remember the day when I gave my job talk here. That room was full of people from across the Behavioral and Policy Sciences area: IR, Innovation, Strategy, and some Ops Management people had come as well. I knew Charlie Fine, for example, plus Dan Roos was there and a couple other people, such as Jim Womack. The topic I was studying and

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how I was studying it didn't fit neatly into a box. Sloan was flexible, whereas a lot of other schools are not.

As a matter of fact, I didn't even apply to most other business schools. I was invited to give talks at Columbia and Chicago. Columbia was far too rigid. Chicago was interesting in that they offered me a job, but I didn't fit at all into the group. They didn't actually have real groups. They were so flexible that they basically just hired people and had you teach things. So Sloan was a bit more organized, and it just seemed like a great fit. So that was a tremendous advantage of the culture at MIT.

Over time, we've emphasized more the discipline base of people, but we don't really care which discipline you come from. It could be history, it could be political science, it could be sociology, psychology, or economics. But if you have that base, then you could have broader interests. It works fine.

So getting back to how I choose these topics. I always want to do something that's going to be more important when I'm done with it than when I start it. Something that's rising, broadly viewed as important. I don't want to waste time explaining why I'm studying something. I want to leverage my skills. My skills, at least initially, were understanding Japanese and certain Japanese management processes. This proclivity for diving deep into phenomena, understanding texts and artifacts and data, and putting them together.

The other thing that happened, starting roughly in 1985, was that I spent a lot of years trying to understand elements of computer science and software engineering that would allow me to really do some deep work in software. I don't exactly know why. The threads are all there. For some reason, in 1985 as I was finishing my Japanese automobile book, I was thinking, "What's the next great problem that the world needs to solve?" I thought it would be the role of software. The PC had just come out a few years before. A huge problem for Japan was, could they figure out how to do software development. So that's actually what I tackled with my second book, *Japan's Software Factories*. Could you apply to software development the skills you acquired in production management, quality control, and engineering management more broadly, which I had learned about with the automobile industry. To me there's this very clear thread how I moved from one industry to another.

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G: But the methodology was examining companies that were trying to do it and seeing how they did.

M: This is what happened. I started exploring how are people trying to structure software development, and how were the Japanese grappling with this—a country known for hardware but not software. It turned out that the first software factory in the world was created in Japan by Hitachi in 1969. This was an attempt to bring people together and understand the challenges of software. Hitachi always had a strong incentive to structure software development and rely on its processes and training and creating reuse libraries and automate some things. The kinds of things that sounded like factory-ness. So that's how that started. It was again Japan that dragged me into this.

That led to all sorts of things that I never could have foreseen, or at least understand or learn about software development different approaches. It turned out in the 1980s, Japan was backward in software but at the forefront of other things. The government was pushing many things in software and artificial intelligence; the Fifth Generation project was one thing they had. Several American computer scientists had already gone to Japan and actually found that the best quality in the world, at least in terms of defects, was actually coming from Japanese software producers. Why was this? So again, the timing was quite good. I hit a really interesting nerve.

Then as the software industry in the US was starting to grow, a lot of companies here became very interested in process. They thought they could learn from the Japanese. For example, the U.S. Department of Defense established the Software Engineering Institute at Carnegie-Mellon in 1988. I became dragged into the center of this type of research and was asked to give keynote speeches at all kinds of computer science conferences, software engineering conferences, and at companies.

I finished that book in 1991 and that opened other doors. It turned out Microsoft was very interested in that research and then I became interested in how do PC companies develop software? We knew nothing about that. So I had a Management of Technology master's student, now he would be called a Sloan Fellow student, here at MIT IBM, named Stan Smith. He came to my office and said, "I want to do a thesis. I heard you're interested in software process. What's a good topic?"

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I said, “Let’s compare mainframe guys like IBM with PC guys. We don’t know anything about this.” He said that IBM had done a project with Microsoft called OS2 and he had some contacts.

I said to him, “If you can get an interview with Microsoft, I’ll go with you.” So he got it and I flew out with him. We flew out to Microsoft in 1992. They gave us a presentation from the Director of Development, a guy named David Moore. I had already written my *Software Factories* book and in writing that book, I studied the whole history of software engineering and wrote a full chapter on how companies tried to tackle software development, what IBM did, what the Japanese did, what other companies did. There was another big software factory created in the US that ended up influencing the standards that Department of Defense set for software development.

But, when I heard the Microsoft story, I immediately recognized there was something different here. Their process was more chaotic, but much faster, less structured. Today we call it iterative or agile. But it had all those threads of structuring and scaling up a hacker kind of process, giving you a balance of innovation capabilities, but speed to market and some control, so that projects didn’t get too out of whack. The problem with software development is it’s not production, really, it’s a design activity. I immediately recognized there was something very special there and I proposed that I would like to do my next book on them. I couldn’t write it with an IBM guy, so Stanley Smith graduated and we wrote an article together, which later came out in another book.

I had been doing some consulting at that time, trying to establish software factories in some companies. I worked with Motorola and Alcatel in Europe, a couple other companies, and for some of the more technical assignments, I invited a computer science professor whom I had met at some conferences, named Richard Selby, to join me. We had worked together for two years with Alcatel in Europe, for example. When I saw the opportunity to do the Microsoft book, I invited Rick to join me to co-write it. So we did that book together, *Microsoft Secrets* came out in 1995 and that also changed my career very much, and put me very much in the middle of a huge, growing interest in software.

Then the Internet happened and I did another book on Netscape and Microsoft, called *Competing on Internet Time*, co-authored with Professor David Yoffie at HBS. Both books ended up as *Business Week* bestsellers. The Microsoft book I knew would be important.

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The Internet time book I also knew would be important. Netscape disappeared pretty quickly, but understanding the Internet and the impact on what innovation in business was quite interesting.

That led to other kinds of things. It led to my interest in platforms, which I had studied with Dick Rosenbloom on video recorders, the second paper I did. The first one we did together was on Betamax versus VHS development. We published that in 1987. It was called, “Technological Pioneering and Competitive Advantage: The Birth of the VCR Industry.” But even though we understood who won the development battle, the first article didn’t tell the story of who won the market war, because VHS was later to market but actually became the dominant standard. VHS ended up with 100% of the VCR market, and Betamax ended up with zero. You don’t have the answers to those questions from an operations management kind of study. So, partially being motivated because I had now been teaching strategy for several years, I wanted to write another paper, which came out in 1992. The second one, which I took the lead on, was, “Strategic Maneuvering and Mass Market Dynamics: the Victory of VHS over Betamax.” That was the first historical article that collected lots of data, looking at what today we would call platform dynamics and network effects, these kinds of things. We didn’t have the language of today, but that was really the first attempt to do it.

Very similar phenomena as to why Windows or DOS machines beat Macintosh machines and later Intel microprocessors beat competitors. All those issues came together in a book I did with a doctoral student, Annabelle Gawer, in 2002, *Platform Leadership*. This was largely about Intel, but then with comparisons to Microsoft and a some other companies, including Microsoft, Cisco, NTT Docomo, Linux, and Palm. So there’s always been this thread (of platforms).

G: A huge, broad industry question really applied and appropriately

M: Each one builds on the other, but my interest in software and platforms or Intel all started with an interest in software engineering. Then the strategy issue was connected to this. Actually, it’s putting together strategy and innovation. There’s no point in developing these deep, unique engineering or innovation capabilities if you don’t know what to do with them as a company. Particularly from teaching strategy so often, I began asking more strategy questions, which I didn’t necessarily ask in my Microsoft book. There I asked more questions about

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technology. In the automobile book, I also asked about how do you acquire these capabilities, build the infrastructure, the supply chain, the systems? But it was also, “How do you move machinery around to get the kind of connectivity the Japanese were getting.”

With *Microsoft Secrets*, I started asking more of the bigger, strategic questions, but tying it all the way back to more capabilities issues, say in engineering or product development. Platform leadership was much more broad. But it was looking at many of the same issues, at least in software.

B: These are big projects with a lot of data to be collected. You’ve mentioned having PhD students and co-investigators. Can you say a little bit more about how you actually organized to get this done so it doesn’t take ten years, you can get it done in a couple of years? You must be employing quite a bit of research assistants... Do you take sabbaticals to do it?

M: There’re a couple things here. One, my teaching load has always been relatively low at Sloan – generally two courses – and I had that agreement when I was hired until tenure. That was the agreement, just two courses or two sections of a course. For five years or so I taught one section of strategy and one section of my Japanese technology management course. But that was taking my research and forcing me to write it up into papers or chapters of books. I would teach in my class a section about software factories, a section on product development in video recorders. All that stuff. So I was developing my papers and books for that course. For a number of years I taught just two sections of strategy. After the interest in Japan waned, after 1989, I stopped teaching the elective. So it was a pretty low teaching load.

The other thing is that for the other books, I had doctoral students. *Thinking Beyond Lean*, the product development book in the auto industry in 1998, was based on Kentaro Nobeoka’s doctoral thesis. He had been a product planner at Mazda, did an MBA here, and then came back and did a PhD. We didn’t have research assistants for that. It was basically Kentaro and myself. We did 350 interviews of engineers. He did more than I did, but I was with him a lot. We had a lot of resources from the International Motor Vehicle Program.

Platform Leadership was based on Annabelle’s doctoral thesis. She had come to me with a bunch of topics and one of them related to platforms. I remember circling it and saying, “Study this.” We got access to Intel, so she was going to do a broader thesis about it. But

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because we managed to get access to Intel in a deep way, she ended up writing the whole thesis on Intel. Then we added chapters on Microsoft and Cisco and a few other companies for a book. No research assistants there.

I did a book, *The Business of Software*, in 2004, which took materials that I had developed for my course. I started teaching the software business class in 1997. That was my next elective. I stopped teaching Japanese technology management in 1990. Then I took a sabbatical in 1994-95. That's when we wrote *Microsoft Secrets*.

M: My next sabbatical was 2001-02 and that time we wrote *Platform Leadership*. I wrote most of the final manuscript but it was based mostly on Annabelle's thesis, so it was a lot of her work. It wasn't just a lot of writing to put into a book form. During that sabbatical I also wrote a first draft of *The Business of Software* book, which came out in 2004. But it needed a lot of reworking after the collapse of the NASDAQ and high tech, the Internet boom and bust.

So sabbaticals were useful. Doctoral students were useful. We did have another kind of research help in the *Thinking Beyond Lean* book in 1998. That came from some of the masters' theses and a couple of other PhD theses. But it was mostly Nobeoka's work for his thesis, which again I had supervised and helped to kick off.

G: You've been more closely linked to research centers.

M: We started the Center for Digital Business. That was originally the E-business Center. I remember getting a grant from the Dean's office to start the research that led to my book, *Competing on Internet time: Lessons from Netscape and the Battle with Microsoft*. That came out in 1998, and I connected that work with the Center as well. I think I got some support from the Center. I've never been very good at using research assistants, except when I really had data-intensive projects. I will say that when I wrote *The Business of Software*, I had a lot of data in the book. It's what happens to a product company when the product business collapses or products become free, like with the Internet. How do you compensate for that? Most companies actually turn to services of different types. So that was an empirical question.

In 2003 I started building databases and I hired research assistants to do that, including some doctoral students. I created a database of all publicly listed software product

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companies on the US stock exchanges, as well as all IT services companies and then some industrial companies that report both product and service revenue. That took many, many years. I published a few papers along the way, but the first really major paper came out in *Management Science* just last year, 2012.

We have another paper under review. For that as well, I mobilized two of my former doctoral students, Steve Kahl and Fernando Suarez. They're my co-authors because I needed Freddie's econometric skills, and Steve had been an industry analyst in the software business for Goldman Sachs and Piper Jaffrey. Those papers address some of the data questions of what happens to a product company when it turns to software as a service or professional services that I first asked in *The Business of Software* book. Still working on that research stream. We have a second paper that should be out in *Strategic Management Journal*. We generalized this issue to any company that finds their products commoditized and turns to services or solutions.

I guess the next major thing was the good opportunity I've had to think back about my research and put it all together and figure out what have I done. It came when I was asked to do the Oxford Clarendon Lectures in Management Studies for 2009. I was on sabbatical 2008-9 and Oxford invites you about four years in advance. You have to do three lectures, then write a book based on the lectures. They give you a year or two to do the book. They asked me to look back over my research and synthesize the new research and old research.

I organized my work into principles of what makes a firm able to compete effectively over long periods of time. My first principle is about creating industry platforms, not just standalone products. The second one is about services to complement and de-commoditize products. The other four principles are about capabilities, pull concepts, economies of scope, and then flexibility. They actually tie together everything I've looked at from agile and Internet development at Microsoft and Netscape, to the Toyota production system, software factories and their pluses and minuses.

Anyway, that was another big opportunity, done again with a sabbatical. No research assistants. I do have a research assistant now, not here at Sloan but over at Harvard for another book I'm doing on the thought innovators: Bill Gates, Steve Jobs, and Andy Grove. That's being done with David Yoffie. He and I did the *Computing On Internet Time* book together. We are using Harvard resources to pay for a research assistant.

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B: What are you going to be saying about these great innovators?

M: This new book is called right now in working title *Masters of Strategy: The Strategic and Leadership Principles of Bill Gates, Andy Grove, and Steve Jobs*. It's mostly a look at how they thought about strategy and how they executed it. One thing they have in common is that these three companies all were or became great platform companies. There's some resistance to that from Jobs, actually. He always put the product first and platform second. So there's some interesting tensions there on how they thought about, or connected vision to strategy.

B: How are you going about opening up that subject?

M: In some ways it's a synthesis of stuff that David and I have done. David has been on the Intel board since the late 1980s, which came from writing cases on Intel. David has written many cases on Apple, Microsoft, and some on Intel. The *Microsoft Secrets* and *Platform Leadership* books have a lot of my material on Gates and Microsoft. I have followed those guys quite closely for a couple of decades and have learned a lot about Gates and how he thought and how he interacted with people around him. We're going to do some interviews. I've also been writing more about Apple the last few years.

B: What do you think of Isaacson's book?

M: Fabulous book. Tremendous amount of information. Actually, on these three guys there's quite a bit written. Andy Grove wrote several books himself. One was a very famous book, *Only the Paranoid Survive*, in 1996. Another book he wrote is called, *High Output Management*, around 1991. There are been some other book on him. We also have a lot of insightful materials from all the Intel board meetings since Andy became CEO in 1987. So we have a very good picture of him. We have a pretty good picture of Jobs, and I have a pretty good picture of Gates. So we're writing about them during the times they were CEO. It's what other CEOs can learn from these three guys who were unusual in their own way but they created three great companies with a whole bunch of interesting challenges. Again, it's more like a synthesis

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book. David and I wanted to come back together and do another book while a lot of these issues were still fresh in our minds.

B: This is a great journey in terms of your research. You probably have some questions about other aspects of...

G: I was going to say, to step back maybe from your research and look at the Sloan School and the educational programs we have here, and how they evolved over time. Your way of understanding management and business is to go back out to these leaders, as you were just saying. Look at what Grove and Jobs and Gates have done. How does that influence what we teach here and how do you see the role and development of the Sloan School in the almost 30 years that you've been here? 28 years.

M: It is true that I'm one of the people who has really put my research first. I certainly pay a lot of attention to my classes, but I have managed to merge the two. Teaching the software business class since 1997 keeps me current with almost anything happening there. For many years I called it the "Business of Software and Digital Platforms," because now we do anything that's software driven. Next year I'm retitling it *Software and Internet Entrepreneurship*. I don't relate so much to programs here, but I will say when I was doing my early work on Microsoft, they were still considered sort of a startup. That brought me into the world of working with startups.

Since 1996 or so, I've been sitting on startup boards and working with early-stage companies as advisors or whatever. This morning I spent with the Entrepreneurship Center. They have startup companies here all summer, and they have quick board meetings to supervise what they're doing. I think that's been a tremendous program activity at Sloan, which I've connected with quite well.

For 15 years I also taught the core Strategy class. When Strategy was essentially kicked out of the core in 2000, I thought that was a travesty and a tremendous disservice to our students. It gradually became obvious that it was because half our students go into consulting and they don't have any strategy class when they do those interviews and start their internships. I don't know what the goals of our curriculum have really been.

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Whether this is positive or negative, I think our curriculum is the lowest common denominator curriculum of what people can agree should be there in one semester. The one-semester core gives us great flexibility, but it doesn't let us do very much in terms of formal curriculum. When I first came in 1986, we didn't have a one-semester core, we had a one-year core. I forget when we adopted the one semester, but anyway, it's become symbolic of flexibility and let the market determine what the students take. But I think we lost a sense of defining what a Sloan MBA is when we shifted to that.

So I pretty much focused on my own courses and my own research and tying them together with my own activities. After Strategy was removed from the core, I didn't want to teach strategy any more as an elective and didn't. So for almost ten years I did break my initial agreement to split my time between the two groups. I taught the "Innovation and Entrepreneurship" class for the Sloan Fellows and then "Strategic Management Technology for MOTs" for a number of those years.

Two years ago, I went back to Strategy when Rebecca Henderson left. We had no one to teach an advanced strategy class. I was asked to teach it and took it up and have been enjoying it tremendously.

Programmatically, I haven't really been terribly excited with what we do in general for the MBA curriculum. The Sloan Fellows curriculum is longer, there's more of a flavor that we define there. We've done other things like the E&I program. We have defined something that goes beyond the core for those students. We experimented with tracks at different times and they didn't really take off very well. E&I as a kind of track now is very popular when students sign into it, but relatively few complete it.

I think Sloan has a bunch of great professors and great students and the environment here for innovation and entrepreneurship is unmatched by any school. I think it's even better than what you have at Stanford. We are not necessarily Silicon Valley but we have a great environment here. I don't think we do a hell of a lot with our MBA curriculum. It's just my opinion.

The training of doctoral students I think is quite good. We have all sorts of other programs and other assets. I created another program, "Master of Science in Management Studies" for overseas partner schools. I guess we're in our fourth class now, which has been reasonably successful. We have 35 very good students from around the world, about two-thirds

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of them from schools with which we have some kind of partnership or collaboration. So those kinds of things are interesting to me. I helped start the China program in 1995 with Alan White, when we both went out to China.

B: To Tsinghua and Fudan.

M: Right. Actually I was sent there because I was on sabbatical in Japan in 1995.

B: They thought, "You're close by," eh?

M: I'm close by. I met Alan White in Beijing. We had decided in personnel committee that we would do a program in China but we wanted to pick our partners. We narrowed it down to Fudan and Tsinghua, and I was to spend two days at each school interviewing faculty, and then decide which one to work with. So I did that. Bob, you might have been around at that time.

B: I was in the Dean's office.

M: So I came back and I wrote a report saying, "These are two excellent schools. Very different. Why shouldn't we work with both of them? Why should we just do one? Let's have two."

B: Lester was dean at the time, I think.

M: Right, Lester Thurow was dean. So that's what we did. I don't remember who became head of the program. I think Lester did it initially. But I think international programs we've done very thoughtfully. I was head of the Sungkyunkwan program in Korea with the Samsung Foundation for 8 years. The SKK program. It was actually a request from them to do a joint degree that led me to come up with the MSMS program. It's not a joint degree but kind of a dual degree. So those kinds of programs I think we've done really well with.

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G: You play a role in the *Sloan Management Review*.

M: I was also the faculty head and editor-in-chief of *Sloan Management Review* for a year and a half or so when we had a gap, when we had to let someone go. For three years I actually ran SMR as faculty head and presided over the transition from when we were just this black and white, student-run kind of magazine, to a professional magazine. I guess or 1998-2001. When I went on sabbatical, I turned it over to Arnaldo Hax and have still continued to be involved with them on the editorial advisory board. I was also on the committee that hired different people and do some oversight. And that's actually been a really rewarding experience too but it was extraordinarily time consuming. I was there at midnight with my sleeves rolled up editing articles, which was actually one of the problems that we've had at SMR. I called it a diamond in the rough. We had this tremendous asset that, in some ways, had a unique positioning in the market. It was relatively rigorous, research-based material for practitioners. Much more rigorous than HBR, but these were not academic articles. It was refereed as well. So that was a niche I thought we weren't fully exploiting. We made it more readable. We cut down the length, we gave it color, we hired some editors to help authors write their articles. But the unfortunate thing was the publishing industry basically collapsed after 2000. Even the NY Times has almost gone bankrupt a couple of times. So it was a difficult time. Later on, Erik Brynjolfsson took over and has done a great job trying to figure out ways of engaging with the web community more. Earlier on, we made some decisions like we would not become free. We also did start a website development. I think it still is an under-utilized asset. But one of the problems with Sloan is that we've never really wanted to put much money into it. Sort of milk it as a cash cow, and you really need money sometimes to hire really good people.

G: OK.

B: I don't know whether there are other chapters in your connection to Sloan that we should...

M: The only other thing we haven't talked about was the importance of the areas.
Might as well get on the record.

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B: Since you just finished three years as Area Head, that would be great.

M: Yeah. I actually feel that the areas are a unique feature of Sloan. It lets us think more broadly than just the boxes that we associate with specific teaching groups. In this past few months, there was a suggestion from the Dean's office that maybe we don't need areas any more, just work with the groups. So then I started investigating whether that was true and I think I got very mixed feelings, and it differs across the school.

G: Differs across areas?

M: Differs across the areas, right. So management science is a loosely connected bunch of different groups that don't have much of a common core. Historically many of the faculty have been in separate buildings. So there is a management science area head who works quite hard, but he has to work hard because they're pretty disparate groups. And most of the heavy duty lifting is really done by the group heads for teaching plans, hiring, and that kind of thing. The area heads have different roles. I've actually come to understand better what role the area heads should play. The group heads always have a particular role, which is teaching plans and recruiting and managing research seminars or the PhD program, all that kind of stuff. But area heads play more of a role in personnel, particularly junior faculty, but also in school governance. It's important to have some view, when the Deans are debating making a particular decision, of what might the management science faculty think about this? And you can't have six group heads in the room from management science, plus another half dozen or dozen from the rest of the school. Just too many people. You need someone who could speak for the faculty in a relatively common area.

Management science has the least commonalty. EF&A and BPS have a lot in common. In EF&A, just about everybody is an economist. That's their common discipline. They have weekly lunches and they relate quite well to each other. Finance is its own unit and so is accounting and so is applied economics, but there's a lot of commonalty. BPS was the last area to be formed, a collection of groups that were essentially social scientists of different types. Qualitative and

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quantitative. We have economists, we have psychologists, we have sociologists, we have historians and political scientists. But it's more of an interest in organizations and policy related to organizations and their environment.

As I looked into this, most business schools do not have areas, they just have groups or units. We are unique in that and I think it's been a unique positive feature of the school. For example, I might not have been hired at Sloan if there were not areas. There are other people that have been attracted here because they don't fit easily in one group. Ezra Zuckerman is another one. The reason I asked Ezra to succeed me as area head is because he's always thought broader than his own group. He's a sociologist, but teaches strategy. He also helped create the economic sociology PhD program. So the area heads, as I've concluded, have to be different from group heads. They're not supervisors of groups. The Deputy Dean supervises the groups. But they really can play an important role in school governance and representing the faculty in these different disciplines. And faculty in groups or junior faculty often have issues and questions, and sometimes doctoral students too, that don't fit so well within their groups, or they're not so comfortable in groups, and it's important to have someone that has a broader view than just as a group head. So the governance structure, which I thought we always had, was Deputy Deans meeting monthly with area heads and debating these different decisions. And then other kinds of decisions are made at the group level.

I think ultimately the deans realized that this was a useful governance structure at least for the moment and actually to get rid of it would create more of an uproar than it was probably worth. I think, though, that we've been moving towards a more corporate-like governance structure with professional administrators taking over a lot of the roles that were done by tenured faculty, particularly Deputy Deans. Now we have more professional administrators and we have even less of a faculty voice. So one of the conclusions I came to was that it's even, in many ways, more important that we continue to have area heads meeting monthly with the Deans to review what the school is doing, so that we don't have policies made that don't have proper faculty input. I had come to agree that a lot of my colleagues seem to be ambivalent about the value of areas and area heads, so I was willing to agree with the deans that maybe there are other governance structures we should experiment with. Like designating some group heads to be the

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people that meet with the Deans on a regular basis to review policies that are being considered. But I didn't think it was reasonable to have a dozen group heads trying to meet monthly with the Deputy Dean. But for the moment, they'll continue with the area structure as it stands.

B: Mike, this has been terrific, to better understand your career here, your journey. Just fabulous.

M: OK.

END OF INTERVIEW