

MICHAEL C RUETTGERS

ORAL HISTORY

**COMPUTERWORLD HONORS PROGRAM
INTERNATIONAL ARCHIVES**

**Edited Transcript of a Video History Interview with
Michael C Ruettgers
Executive Chairman, EMC Corporation**

Location: EMC Headquarters
Hopkinton, MA

Date: May 2, 2001

Interviewer: Daniel S. Morrow (DSM)
Executive Director, Computerworld Honors Program

DSM: Today is May 2, 2001. I'm Daniel Morrow, Executive Director of the Computerworld Honors Program, a program established in 1988/89 by Patrick McGovern of International Data Group, Computer World, a committee comprising the chairmen and the CEOs of the world's leading information technology companies, and Roger Kennedy, then director of the Smithsonian Institution's National Museum of American History.

We are interviewing today Michael C. Ruetters, Executive Chairman of EMC Corporation. This interview is taking place at EMC's headquarters in Hopkinton, Massachusetts. It is made possible by the Computerworld Honors Program as part of an ongoing series of video biographies of the leaders of the information technology revolution. This interview is being recorded for the Computerworld Honors Archives online and for distribution to more than 140 museums, libraries, archives, and research institutions in more than 40 countries on six continents.

Without objection, the complete video, audio, and transcripts of this interview will become part of the public record and part of those research collections and will be made available in edited form on the World Wide Web. This discussion is private however, and should any participant wish to withhold from the public record all or part of these recordings, that request will be honored for a period not to exceed 25 years. All present in this room are honor bound to respect such a request and by remaining here accept personal and professional responsibility as well as legal responsibility to abide by these agreements.

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DSM: I hereby officially begin the interview and repeat the admonition that this is Mike's until he releases it, and no mass exodus from the room having been noted, I'd like to begin by just having you state for the record your full name and tell us when and where you were born.

MCR: Michael C. Ruetters. I was born in Muskogee, Oklahoma in 1942.

DSM: You were born in the darkest days of World War II for the United States.

MCR: Yes.

DSM: Tell me about your parents.

MCR: My father was in the military at that time, and continued to be in the military until he retired with roughly 30 years service in the Air Force. So during the war he, like my father-in-law, was a training pilot to fly in the war. They were the old guys; they were two years older, three years older than everybody else.

DSM: So did you actually grow up in Muskogee?

MCR: No, just passing through. I was born in Muskogee in late '42, and in similar circumstances in late 1944, my brother was born in Victoria, Texas.

DSM: So you were moving around.

MCR: Right.

DSM: Was there someplace that you call home?

MCR: Probably Los Angeles, where my grandparents were on my father's side. His family had moved to California at the start of the Dust Bowl.

DSM: From where?

MCR: From South Dakota, and we have the photograph everybody has of all the belongings being piled onto the Model A and leaving the sod house and heading for California.

DSM: Ruettgers, is that German?

MCR: Yes it is. It's German. It's a bastardized -- if you go back to the Civil War records, it was written Reitger, R-E-I-T-G-E-R. And over permutations, insurance claims, that kind of thing, the E and I probably got done as a U. And somebody said, well, it's German, and it should have umlaut over it, and that adds an E. And so eventually we got to R-U-E-T-T-G-E-R-S.

DSM: Well, at the risk of diversion, you said your great grandparents were in the Civil War?

MCR: Right, from Wisconsin as it turns out.

DSM: Do you know the units by any chance?

MCR: No, I don't. I have the stuff and the discharge papers and that.

DSM: I would love to talk to you about that later. Growing up as the son of an Air Force officer you obviously moved around a lot, where did you start grammar school?

MCR: I started grammar school in California. The progression was after my brother was born in 1944 we were the first American dependents to go into Japan in January of 1946.

DSM: So you were three or four?

MCR: Four, something like that.

DSM: Do you remember anything about it?

MCR: Parts of it. We have photographs and what's amazing with the photographs is that there was literally nothing in Tokyo standing.

DSM: My God.

MCR: These are unofficial photographs taken from planes. There were a few chimneys, but that was about it, except for the Imperial Gardens. Everything else had been bombed out.

DSM: Heavens.

MCR: So we were there for a couple of years, and we came back to California for a short period of time. That's where we started school and then we went to Ankara, Turkey. And we were there because at the time there was concern that with the Iron Curtain Greece and Turkey would go Communist, so we were part of an Air Force group designed to bolster the Turks.

DSM: Yes and the Greeks and Turks were right on the rim.

MCR: Right, and the concern was both parties would go Communist. Of course the Turks would probably never do that, and the Greeks probably were at the time.

DSM: Now your dad was not only an Air Force officer and a pilot and trainer, but attended UCLA.

MCR: Yes, that's right.

DSM: Which is pretty unusual for people, less than 5 percent of Americans in those days had college degrees.

MCR: Well he was on a football scholarship, and played football with Jackie Robinson.

DSM: Are you kidding me?

MCR: And a guy named Kenny Washington, who was actually thought to have been a much better athlete than Jackie Robinson.

DSM: So you met these guys when you were --

MCR: No. This was when he was in college and then he left that and enlisted.

DSM: I want to talk about school or early teachers you remember. Did you learn to read before you went to school, or are there things like that you can remember?

MCR: Well the first schools were Catholic schools in California. Then when we went to Turkey, it was a small group and there were no schools for the first year. Some of the families had brought the Calvert system with them, which was kind of a portable school box used primarily by people that cruise around the world so that you can educate your kids with these systems. So some people used that. We didn't. When the school finally got built and we had teachers, there was an acceleration to get everybody caught back up. So we did kind of two years in one year to get caught back up. But yes I could read and was always a pretty avid reader.

DSM:

One of the things I've been trying to collect is the names of teachers who may have made a difference. Are there some early teachers that you can remember?

MCR: No. One of the difficulties was that there was never a school that I went to, even through elementary schools and into high school, where I was there much more than two years. So you were always turning over anew, and one of the things that you learn in this is how to really quickly make friends, because the environment keeps changing. I lived in 21 different places by the time I was 18. As my father would go from training to fly a new jet, he'd go someplace for three months and then another place for three months and we would get moved along right with him quite often.

DSM:

Of the 21 places that you lived in -- I know you lived in England and Japan and in Germany -- is there any place that was a favorite for you growing up?

MCR: I think growing up in London was my favorite. I was a freshman in high school and although we were boarding and went home on the weekends, every other week we would stay and one of the dorm monitors would take us into town to see a play or go the museums, those kinds of things. So you became very familiar and comfortable with the city of London and for a long time it was one of our favorites.

DSM:

This is during the mid 1950s and you were about 14. With a dad in the Air Force and being in London, you were in the midst of an extraordinary place, an extraordinary time. Some of the real heroes of the 2nd World War were still alive and beginning to talk and publish.

MCR: Right.

DSM:

Our theme has been a search for new heroes. Were there people that you met during that time that really made an impression on you?

MCR: Well certainly, just reading the books, the Second World War was only over about ten years and lots of personal accounts were being published. And I really used to enjoy reading those accounts, people like Douglas Bader who lost his legs and yet still flew as a pilot.

DSM:

Any heroes from your youth that stand out? Those of us who were back in the States had fictional ones like the Lone Ranger, as well as real ones. You also had a dad who was an officer.

MCR: Well, there was a series of books, and I don't know who published them, about people like Kit Carson and Davy Crockett and all of the rest of them.

DSM: Real Mark Books.

MCR: Is that what it was? I've read all of those and individually each one of those people were heroes.

DSM: They came out about once a month.

MCR: Right. This whole collection was always inspiring, to see what people were able to accomplish.

DSM: What made you decide to go to UCLA? Did you have any desire to go into the Air Force or be a soldier?

MCR: Actually I applied for the Air Force Academy but in typical fashion was put on a waiting list. And I decided I didn't want to wait; I'd go to UCLA. So I went to UCLA took an ROTC scholarship, so that would have headed me in the military, irrespective of going to the Air Force Academy.

DSM: How did your dad feel about a naval ROTC?

MCR: Well, he had actually been in the Navy ROTC at UCLA also. He made the switch and he probably assumed that I would make the switch too.

DSM: One of the questions I ask is about first cars. I understand you owned a TR3.

MCR: Right, I did.

DSM: Was that your first car?

MCR: Yes it was because being in Europe at that time you couldn't drive until you were 18 or so. So being in high school in Europe you were never allowed to drive. Nobody was old enough

to drive. So when I came back it was senior year in high school and that was the first time I could actually drive a car, and the TR3 was the first.

DSM: Were there any people that followed you around when you were moving from place to place that you had long-term friendships with?

MCR: My parents' friends, a number of whom we still keep in contact with.

DSM: Okay. Now tell me the story about UCLA and then going to St. Martin's.

MCR: Well, UCLA was one of those events where you're away from home, you have a TR3, you're in California, the Navy is giving you a reasonable amount of spending money, and it's just easy to get distracted. So there were kind of two distractions. One was bridge. I played a lot of Tournament Bridge with a roommate who had a little bit more discipline. At least he managed to stay in school. And then between bridge and other things, my grades just weren't good enough to hang around. The only person I knew that had worse grades than I did was a friend of mine whose name was Mike Haffner. He was on a football scholarship and ended up being an All-American.

DSM: Another question I'd like to ask, you started out as a math major at UCLA?

MCR: Yes.

DSM: Obviously you had a talent there. Are there any stories that your family tells on you that gave some early hint of what you were going to do with the rest of your life?

MCR: No. At least they don't tell them in my presence. I think they were just happy I got a job after the way I started, that I wasn't a drain on family resources.

DSM: Let's move from UCLA and math, to St. Martin's. I've heard you refer to St. Martin's as the penalty box.

MCR: That's essentially the penalty box or the rehab period. You go someplace, get a second chance, and decide that you really want to focus on academics and get your head straight. That's essentially what St. Martin's provided for me.

DSM: You transferred to Idaho State your junior year?

MCR: That's right. St. Martin's was a small liberal arts school and finishing that, I wouldn't have been able to pick up a business degree or any of the rest of those things. So I had to choose where to go and my concern about that is I get back into a big school and it would be a repeat of UCLA, and I'd be back for my senior year at St. Martin's.

DSM: Yes, well that would be a pretty big contrast from UCLA.

MCR: Yes it was. At UCLA there were 17,000 students, St. Martin's had about 400, and the University of Washington about 35,000 at the time. So the compromise was Idaho State, which had a business program, a school of about 3,500 students. So it was smaller, it wasn't on the West coast, you didn't have beaches and some of those things, and maybe I'd stay away from some of those problems, too.

DSM: Were there teachers at any of these -- well, I was thinking in particular of Idaho State -- but any of these places that made a strong impression?

MCR: One was the dean of the school at the time, a guy by the name of Frank Seele who was pretty good at motivating people. Not only recognizing what people can do, but he was willing to challenge people, to kick you in the fanny a little bit to make sure that the impact worked a little bit harder on some of these things.

DSM: For a guy who went through three schools as an undergraduate, you got into a pretty good graduate school.

MCR: Well there are two things related to that. One is my grades the last couple of years were very good and on the graduate admission test, my scores were very high. And I think Harvard was also looking for somebody from Idaho. They probably hadn't had anybody from Idaho for ten years. So I'm not even sure I would have needed scores that high, just being from Idaho got me on the geographic draft I think.

DSM: Who really got you interested in going to Harvard?

MCR: Harvard was number one at the time and I took the admissions test, and I thought that I had done really well on it. So I thought, why not, I applied to Harvard. Then as backup I applied to schools in the area that had MBA programs where you could be also an assistant so I could do some undergraduate teaching. So I had backups. I had assistantships at all of the Midwestern or Mountain States, Washington State, Utah State, University of Utah, all offered me assistantships. So the choice was, I get into Harvard and pay for that, versus having everybody else pay the rest.

That actually was a big swing because Harvard in total cost me about \$15,000, and I was making \$5,000 a year before I went to Harvard. So it cost you \$15,000 for the two years versus probably making the equivalent offset of \$5,000. So it was a big four-year swing, going one way or the other. But I assumed and hoped, and it turned out probably to be true, that Harvard was worth it.

DSM: Statistically we know that it is. It's a hard enough place to get into now. Harvard was really hard to get into in the mid '60s. It must have been a real confidence booster to get in there, or were you always a really confident guy?

MCR: I think I was always a pretty confident guy and the success I'd had at Idaho State with grades and the success on the admissions test, both gave me some confidence, too.

DSM: Coming to Cambridge has got to be another huge change.

MCR: Yes.

DSM: You were there for about three years?

MCR: Two years is the program.

DSM: Two years. How were you treated as a guy from Idaho and born in Oklahoma, how were you treated by Harvard?

MCR: At Harvard's business school they have very large classes, about 700 people, but they're all broken into sections. So in each section you have 100, a range of people. One of the famous guys in my section was Gary Wendt who was at GE Capital, and was so successful there. But each of the seven sections developed a different personality. Some of them were very aggressive. I was fortunate, our section was known by the professors as the dumb-but-friendly section.

DSM: Who were some of your professors at Harvard?

MCR: Butterworth was one of the historians there. Heskett is still there. Porter was there. Schliefer also who did a lot of the early mathematical stuff around risk adjustment, those kinds of things.

DSM: Were you at Harvard or were you still at Idaho when John Kennedy was shot?

MCR: I was at Idaho when Kennedy was shot. We were driving back from Portland, Oregon with my parents and heard it on the radio.

DSM: In 1968 you go to work for Raytheon. Did they find you or did you find them?

MCR: The connection was that one of my roommates went to work for Raytheon, and I'd gone back to Detroit because I'd been working with another defense contractor on scholarship. After I applied to Harvard I waited until after I had the test results, so I was too late to get in the current year. I was put on the waiting list, and I said, "Fine, I'll take the next year out." So I went into the defense business in Detroit for a year and then got a scholarship from them, which helped at Harvard. Part of the scholarship was a requirement to go back for a year. So I went back for a year and then my friend said, hey -- because I wanted to get back to Boston -- he said, "Why don't you come back?" And he recruited me into Raytheon.

DSM: You were born in an interesting time and you got out of school and into the real world at an interesting time as well. In 1968 was the Tet Offensive in Vietnam.

MCR: Right.

DSM: And Martin Luther King and Bobby Kennedy are killed. Describe what it was like then.

MCR: I think the difference was frankly, which side of the Charles River in Cambridge you were on. And at Harvard, if you were on the Cambridge side with the college, you were very much wrapped up in what was happening on the Vietnam War. If you were on the other side of the river in Allston where the business school was, you were kind of isolated from it. In those days we wore suits to class, okay? Nobody else did on the other side of the campus. Today it's pretty casual, but in those days we dressed up like small businessmen. So there wasn't as much focus for us as to what was going on, as it was what was happening in the stock market. So there was a real disconnect, and I think because we were isolated over there we didn't see the day-to-day disruption and concern coming from students. We were kind of isolated from it.

DSM: Were you still subject to the draft?

MCR: Yes I was. A couple of times that I went down and took physicals, and then because you were still in school -- they were changing the rules all the time. As I said, a couple times I went for physicals, then they would tell me to put my affairs in order, then two days later I'd get another letter saying that you can continue to go to school.

DSM: Now at Raytheon you were working on the Patriot Missile.

MCR: Right. That's right.

DSM: Who did you work with there?

MCR: The guy that ran the laboratory at that time was a guy named Al Mitcheoli. He was probably the father of the Hawk Missile which was the predecessor to the Patriot. He was a really strong leader, an engineering guy.

DSM: When you were at Raytheon, you moved toward becoming manager of their computer services organization, which I'll want to talk about in a minute. But I wanted to ask, what was your first personal experience with computers?

MCR: We got one at Idaho State, an IBM 1620. I think all it was in reality was a glorified card sorter. So we did these marketing projects and we had all this data. We keyed it into punch cards and then we were able to use the computers to sort. As I said, I think all it was was a card sorter really.

DSM: So you're doing SPSS or something like that?

MCR: Yes, we were writing our own little simple programs to try to get it to do some of these things.

DSM: Tell me about your progression at Raytheon. What were you doing on the Patriot Missile, or can you tell me?

MCR: Well, no, where I had been before at LTV, we actually did a pretty good job of project management, organizing engineering projects and that kind of thing. They weren't very good at the technology. Raytheon had just the opposite problem. Raytheon had really excellent technology; excellent engineering people, but this was a very large program that they weren't managing very well. So I came in and one of the things I was asked to do was to take a look at the program. In other words, go around and interview all the engineers and try to do an assessment of it. And at the end of that process I came back and the report to management was that as near as I could tell, we would probably be eight years late and something like \$500 million overrun. And in those days they cancelled programs that the government found out were in those kinds of shape, because they were trying to put money back into the war. So to our credit, that caused Raytheon to do a very quick reorganization of how we went at building the missile. And I'm pretty convinced if we hadn't done that study that the missile would have been cancelled. Eventually the government would have found out, and they would have cancelled the program.

DSM: Relatively speaking, for a program of that size, you were a really young MBA going around doing this interviewing.

MCR: Right. They didn't have anybody else. They didn't have any other MBAs. My boss at the time was a MBA and one of the guys in our little group was a MBA, a guy named Sy Sternberg, who is now CEO of New York Life. So there were a couple of us that came out of that little group. But yes, I think it was one of those assignments that they said, "Hey, yeah, if you want to, go ahead and take a look," with nobody understanding how much trouble that we were in or that we'd discover how much trouble we were in. So the process of doing that was very helpful to them.

DSM: That must have been really interesting, being as young as you were then, going around interviewing guys who were as old as they were then.

MCR: Yes.

DSM: Was that tough? Is that the first time you'd ever done anything like that?

MCR: No, because prior to that at LTV, even though we were writing engineering statements of work, I had to interview people, get them to tell me what they were going to do, write it down, show it to them, and then go off and find out how much it would cost to do it. So I was used to doing the interviews, understanding what you're trying to accomplish, being able to write down what it was. So as you developed schedules, you'd have to ask what they would do next, and what would they do last, and what do they need to have done? What do you need before you can start these things? So it was pretty easy to build. In those days they would talk about 'per charge.' We didn't actually do that, but we had the expertise to do that. So a lot of the expertise already had been picked up along the way, plus the Harvard education helped.

DSM: That was a major project, major decision. Probably even then they had no idea of how important that decision really was. I gather you were essentially given your own organization with this computer service.

MCR: Yes, after that with some restructuring I got some additional responsibilities. Later on we did some more restructuring, and every time we restructured I ended up with a little bit more responsibility.

DSM: You became manager of their computer services organization in 1978, and three years later you sold it.

MCR: Right.

DSM: And then you quit.

MCR: Well, because at that time the Raytheon people that were looking for long-term people that can run the company really wanted hard engineering backgrounds. Mine had been an assumed engineering background. My undergraduate was in marketing, a Harvard MBA in general management. I had lots of years of experience in engineering and understanding, not how to design things, but how they could eventually be put together. But that's not what people were looking for in people that would run the company in the future. So the guy that I was working for at the time was somewhat frustrated because he had a similar situation himself, and he was going to leave. A guy named Dean Bensley, who was quite an outstanding manager, but his background wasn't quite right and he was a little bit too old to make the cut for the next round of CEO candidates. I was kind of in the band that could have, but didn't have the engineering background. So he decided to leave and do something, and I decided to leave and go do something also.

DSM: And you went to Keane Company.

MCR: Right.

DSM: Tell me about that decision.

MCR: Keane was in the software consulting business, what today is called professional services. I was looking for a smaller company rather than a bigger company, one that was more commercially oriented than the defense side. And they were about \$16 million in sales when I joined them and were kind of ticking downward, because in those days professional services companies would often split like amoeba. You'd have groups that would leave each other and you'd continue to have these things splitting, and they'd had that happen to them so they were a bit damaged because they had a charismatic guy that left and took big parts of the organization with them.

DSM: Like all partnerships.

MCR: Right, like typical partnerships. As a matter of fact the company he formed was called Computer Partners. So when I got there it was kind of ticking down, and what they were looking for was somebody that was used to running a dispersed organization. The computer services organization had offices all over the US and was quite well run actually. And they were looking for some professional management to come in and put structure back into what they were doing.

DSM: Here's a quote from John Keene, the chairman. He said he saw in you both process on the one hand and the kind of creativity that you find in an entrepreneur on the other. Is there a story about where he really saw that?

MCR: I think probably right at the beginning, because this was a business that I didn't know very much about. You know, each of the businesses I kind of picked up, I didn't know very much about them. And the process part is after 90 days I got a select group of people. There were about eight of us together, including John and the senior management team and a couple of people who impressed me and we went offsite to have a strategy meeting. Now everybody does that, but the difference was at the end of three days it was pretty clear to me what the four or five things are that we should do. So from that meeting we set off to do that, and the company is quite successful today. But even in those days, we grew pretty rapidly based on those principles. The thing that's interesting is that those are the same principles that the company is essentially using to guide it today, now, some 20 years later. Entrepreneurship, I think we had this opportunity to do things and just being able to look at facts and then make quick, strategic decisions and then get the rest of the organization to move in that direction. Clearly that occurred there, and it was similar to what we've done in the computer services organization. The company was losing money and we changed the whole tenor of the company, changed the focus, got it to where it wasn't losing money, and then sold it.

DSM: Well, they're certainly very fond of you and an extraordinary company. You were there for about six years?

MCR: Right.

DSM: And went to TFS.

MCR: Right.

DSM: Now how did that happen?

MCR: Well, I had come out of Keane and was still toying with whether working in a really small company was something that I could do. They were too small, and the consulting side, while intellectually stimulating frustrated me because you do these studies, you give them to clients, and then nothing happens with them. And I'm thinking I'd rather be a doer than a planner all the time. So that's when I decided to come back into the doing side of things rather than just the consulting side of things.

DSM: Now at TFS there was a young man who was a director named Dick Egan. Was that the first time you'd met him?

MCR: No. Dick had been a customer of mine at Raytheon.

DSM: Oh, it goes back that far?

MCR: Yes it goes back that far. He actually was a customer of mine in the late '70s. He was at a company called Cambridge Memories, and he was the executive vice president running marketing and sales for Cambridge Memories.

DSM: So what did you do for him?

MCR: We did all of their computer servicing, all the maintenance, all the support for his products in the marketplace.

DSM: Did you stay in touch with him while you were at Keane?

MCR: Actually the relationship at that time was fairly adversarial because we were providing the service and were actually working for him. Of course they thought we were charging too much money and we thought that they didn't always live up to what was in the contract. So it was kind of an adversarial relationship.

DSM: You left after about, what, a year and half at TFS?

MCR: Right.

DSM: I guess in retrospect one would say that could have been a disastrous turning point, but who knows how it would have come out -- but you almost went to Texas.

MCR: That's right. I had been recruited down there essentially by venture guys, to help out with Data Point. Data Point subsequently got in trouble and is gone today, for a long time they kind of were a marginal player, and I don't know what finally happened to them. But yes for several years Dick Egan would send me a copy of the stock quotes showing that they were trading for half a dollar or something like that.

DSM: Tell the story, if you will, about Dick and Marino and the decision to join EMC.

MCR: I had this offer from Data Point, and I told the board at TFS that I was going to take this job. This was on a Thursday, Dick was on the board and he said afterwards, "Hey, can we have a drink?" So I had a drink with him. He said, "You know, you really don't want to go to Texas, do you?" And he said by coincidence out at EMC that he and Roger Marino and a couple of others had been talking about the fact that they needed to bring in more senior management. I had been doing some consulting with them at the time, and as he tells the story and reflecting on his recruiting, everybody's agreed that I would be the best candidate. The problem had been TFS, as Director of TFS he couldn't recruit the COO. But now that I wasn't at TFS it was fair game, and what he wanted me to do was think about coming down and meet with him on Saturday morning. Now this is the Saturday before I'm supposed to be in Texas to accept this other job. And he gives me an offer and says, "If it works out you'd eventually run the company," which I took with a grain of salt, because he's recruiting. But on Friday we put the house up for sale, and on Saturday we took the sign down. So for 24 hours the house was on the market.

DSM: That's great. You joined Dick and EMC as head of operations and customer services?

MCR: Right.

DSM: And it wasn't exactly a happy time at EMC when you came on board.

MCR: No, I think at the time we were just seeing what looked like normal rates of equipment failing. Very quickly we were able to determine that we had gotten some disk drives from a

Japanese supplier that had latent defects in them. These things were failing all over the place. Most of the systems we had sold into the IBM marketplace and from a technology standpoint, they took a piece of every file that you had and put it on every disk drive that you had. So if you lost a disk drive, you lost a piece of every piece of your business. And it typically took anywhere from 24 hours to 72 hours to rebuild these systems. You can imagine, we had customers all over the United States primarily, and some all over the world that everyday were having these failures.

DSM: Is the story of customer in tears in Denver true?

MCR: Absolutely. Absolutely.

DSM: And you were the guy sent out to meet with these guys.

MCR: No, there were several of us. There weren't enough hours in the day for only one person to handle all these things. I did a lot of them. A guy named Paul Noble did a lot of them. A guy named Leo Colborne did a lot of them. They were never happy circumstances. What's remarkable is that we did try to stick by the customers. We didn't duck the responsibility, when we made promises to customers we tried as best we could to deliver and we did most of them. What's remarkable, almost all those customers became customers later on, and many of them are still customers today.

DSM: I read that you spent nearly \$100 million, and this was a company that was only worth how much?

MCR: A little more than that. We spent all the cash actually. Technically, in 1989 we were probably bankrupt.

DSM: In terms of levels of anxiety was this the worst that you've ever experienced?

MCR: It was, it got so bad we used to publish a cash report every Friday and we stopped publishing the cash report because there was none. But we had a line of credit from Bay Bank at the time that we were able to survive on, and then we were able to stop the bleeding and eventually pull back. But yes, if anybody had been paying real attention, we were probably technically bankrupt.

DSM: Tell me about motivating the sales staff after this.

MCR: The good news with the sales staff was that most were college kids. So it's like, bring them in, put them through boot camp, and tell them to go off and sell. And they frankly didn't know any better. So if we had had a highly experienced sales organization, they'd have been out the door. One of the things I've learned is typically sales guys are the first line of defense of poor quality. The good ones will refuse to sell a product to a customer if they know the product doesn't work. Our guys in the beginning were all brand new, right out of school and didn't know any different. So that wasn't that bad. We just told them to go back and sell some more.

DSM: About this time you had an interesting insight into the nature of how customers were using the information that they were storing.

MCR: Yes, it's called the Pareto rule. And the observation was that not all the information that a customer has is equal. There's only a small portion of it that's very important to it. But that's the piece that they want the most rapid access to, the most frequent access, and they want it to be available to them all the time. So with that we had some technology that actually matched up pretty well. It was more expensive than the current technology, so we couldn't sell it as we

traditionally sold products here at EMC. We actually had to create a superior, premium product position, and the only way you could do that is by having just a segment of the market that you could focus on. This is a segment where customers wanted a small amount of information, but they wanted high-speed access to it. They wanted high, constant availability and high reliability. So we went after that marketplace.

DSM: And naturally you would focus on a market sector with a small, insignificant competitor, so entry would be easy, and you just go up against IBM.

MCR: That's right, IBM had 80 percent of the market, but the other players weren't slouches either. Hitachi was in there. Amdahl was in there. Storage Tech was in there. Even a company called Memorex Telex was in there, and at that time they were a pretty strong company. So we decided to go after them and IBM was leading, designing systems. Everybody else was copying them and selling them for less. So it's not as though we were competing against five different products. We were competing against one product with slightly different flavors to it, and we weren't building what IBM had done, which was one size fits all. We said, hey, we just want to go after the sector of high performance, high availability

DSM: You scrapped nine major product lines which were producing about 80 percent of your revenue to compete. Tell me about that decision.

MCR: Well, it was the case where we had these other nine products and we only had about \$10 million to spend on R and D. So the average product was getting someplace between a half million and a million dollars while everybody we were competing with was spending multiples of that. So it appeared to me it was a losing proposition to continue to try to do that. So what I wanted to do was really focus the company on one or two areas, and then back on this area of customers really valuing 20 percent of their information. That's what I wanted to go after. So the salespeople could sell any of the products for one quarter, but one of them had to be the IBM product line because that's where we were going to go. And then after that quarter we eliminated all the others. It was 80 percent of the revenue, but because they were already starting to sell the IBM product, we were actually able to fill in the revenue decline. And externally nobody saw any kind of a revenue change. But yes we got rid of 80 percent of the revenue and reorganized people underneath that at the same time and it was almost transparent to financial people watching the company.

DSM: Hence the importance of concurrent product development that you talk about later on.

MCR: That's right. Right.

DSM: In 1992, after four years, you're made CEO here. Then you went to Moline, Illinois. Can you tell that John Deere story?

MCR: As I'd been out talking to customers, I'd begun to have this sense that many of them were frustrated with all these islands of computing that were being arranged throughout their corporations. That there was some desire to send that data back to the people that were running the data centers. So I asked the CIO out at Deere, "Do you at Deere see any sense of these distributed systems coming back in?" And I got a reaction that I always remember. He got red and the veins started to pop out on his face and he said, "I told those bastards not to do it to start with. Now they want me to take it back. I'm only going to take it back if they crawl on their hands and knees over 100 yards of broken glass." And I thought, wow, I really have touched a nerve here. It turned out that other people felt that same way. And I thought, if they're going to bring this information back into the center, it's very important information, and they're going to want to protect it just like they have the other product. But it was a different technology so we had to begin to move the corporation to be able to address that different technology. It was not

mainframe. It was UNIX at the time and some NT. These were new technologies that we just weren't familiar with, yet it was very clear to me that it would become very important. So we started in the direction of being able to bring that technology in so we could get after that marketplace.

DSM: So when the board says, "You're going to re-deploy again?" you can say to them, "I know there's a real need here."

MCR: Well that's a lot easier than it actually went. Nobody was comfortable that there was this market, but with my track record goodwill I had built up, it was, "If you want to try it, just be careful. Just be really careful. I mean be very careful if you want to try it." Those were the kind of caveats that were laid down.

DSM: Oh, I see. So Enterprise Storage is born.

MCR: Which really moved us into the open systems marketplace, because Symmetrix had already been successful in the mainframe. Now it was a desire to move it into a broader part of the marketplace.

DSM: March of 1995 you're \$200 million behind on your sales goals.

MCR: Right.

DSM: Tell the crates stacked in the centers story.

MCR: In 1994 we made it public we were going into the open systems marketplace. To get everybody inside the company to focus, I had to tell people outside of the company what we were going to do. So the goal for '95 was to have \$200 million in sales and so at a point during the year it became very clear that we were real short of that on a tracking plan. So I wanted to do something dramatic that people would understand that this was a serious problem. So I had all that inventory put in the offices of people who worked for me, and it didn't get out until it got sold.

DSM: That makes the point.

MCR: Remarkably, it was probably lucky, by the end of June all that inventory was out of there, and they had their offices back.

DSM: Extraordinary. In 1997, you start an Internet solutions group here but in your interview in the Harvard Business Review, you say that a lot of guys got blindsided by what happened with the Web.

MCR: Yes.

DSM: How big a surprise was that to you as well?

MCR: Well I think there had been talk of it, and as you are out talking to customers I always try to pick up trends, "Are you doing any of this? Are you seeing any of this? Do you know of anybody else?" And usually it's no, no, no, and then you'll find one and then a year later you'll find a dozen, and then a year later you can actually track the ground swell. With the Internet, I was curious as to who was starting to use it. So I was asking and nobody was saying anything. Then I finally found a customer with a double surprise, because it was in the insurance industry which is normally not a leading industry for the use of these kinds of technologies. They're more conservative. And that was in France, which is another place that I wouldn't have expected this

except in retrospect. The French experience with a system called Minitel which was an early Internet system, laid a more fertile ground for them. But I came back and thought if there's a French insurance company that was accepting claims online, that we can't be that far away from having other people. So at that point in time I set up a group because I wanted to be able to experience and understand firsthand what difficulties the customers would see coming through this. And today almost half of the companies that visit EMC go to what we call the Internet Services Group to see what we're doing, because it's clear that what we're doing there is world class. Literally everybody that comes here learns something about how to do it by visiting with us.

DSM: What's the hardest part of the transition to being Web based for you? The sales approach?

MCR: The sales approach was, because in many cases Internet decisions are not being made by our traditional customers. So you have to be out in a broader set of contacts. Now I think over time that these things will come back into the major data centers again. It's the same thing that we saw in the early '90s, where it got distributed out and then it came back. We're seeing a lot of consolidation beginning to occur now too.

DSM: You've described your vision of EMC in what I would say is a highly ethical context. One of the things that we're trying to get at here is the sense of honor and integrity. What are the roots of those among the folks who are really leading this revolution? Where did this come from? Where did your sense of stewardship, your sense of honor and responsibility come from?

MCR: Obviously it comes from the family, from religion, those things. What I think you look for early in your business career is, does anybody in business believe the way that we've been educated? And Raytheon was really the company that, with Charles Francis Adams at the head, was considered a very ethical company. If you go back to some of the defense scandals that occurred in the late '60s, early '70s and that, about payoffs and that, Raytheon was never involved. And it was very clear that officers at Raytheon were expected to have this high standard. You could see it in play, that there was a business that really believed in that kind of thing. So that reinforced what you learn as either your religious experience or your schooling experience. You see someone in the real world applying it, and you say, all right, maybe this isn't just an intellectual exercise. So that's clearly changed or reinforced the way that I've thought about it.

DSM: Is there an individual that immediately springs to mind when you think of real integrity and honor?

MCR: It would be either Charles Adams or Tom Philips.

DSM: The next question is about innovation. You've worked with some of the most innovative people in the world. Where does it come from? Is it having a great problem to work on? Is it being in the midst of great people? Is it individual genius?

MCR: It's all of those and hard work. Equal parts of those things. Innovation never comes from somebody who doesn't work really hard. Inspiration comes from different places. When I was at UCLA I attended some lectures. One of the lunch lectures was with a biologist and he was talking about trying to explain where mutations came from. His theory was you have these DNA cells, and you have all this radioactive stuff flowing through the world, and you get these radioactive charges that cut these DNA cells and then they reform some way. And I've always thought that innovation came from these kinds of rays that pop in and cause people to think and reconnect these kinds of things. And when you do brainstorming you're kind of inviting one of these rays to come in and upset things so that they get repositioned. And it's often the

repositioning of some of these things, like these DNA models, that create a different view of things.

DSM: Those of us in this program, and me especially after 14 years, are really prejudiced on the positive side of this revolution. Do you have any concerns about or are there any downside risks to where this revolution is taking us?

MCR: The risk is around the privacy of information. Thirty years ago, before computers, it was only the credit companies that had much information on you, right? And even then it wasn't very accurate. Today with computers, almost nothing in your life doesn't get recorded in some kind of fashion. So the ability to lose privacy, whether it's in the health-care area or others, is something that we have to be very vigilant on, I think.

DSM: Well, I have two more questions, and I'm just going to indulge my personal prejudice for the next to last. You said that one of your favorite books is Shaara's *Killer Angels*. Who do you like best in that story, and why do you like them?

MCR: You have to like Chamberlain, right? Here's a young kid that goes off as a college teacher, not full professor, but a college teacher, who finds himself in a situation where he's not very well trained, but reacts superbly.

DSM: The last question is always the hardest, I think. We're recording this for future generations as well as our own contemporaries who we hope these will inspire. But three or four hundred years down the road when people look back at this revolution, how would you like for them to think of Mike Ruetters and his roll in this great change?

MCR: I suspect it will be such a small one that it won't even be recognized. When you're looking at some of the old libraries or some of the old museums and you see all these names that have been inscribed on them, I don't know who most of them are, and I suspect that some time in the future there will be some computer museum that has some names. It's not likely to have mine on it, but hopefully they'll remember the Groves and the Gates and some of the rest of those people.

DSM: In the past ten years at EMC, what have you seen change the most?

MCR: I think it's just the importance of information storage. If you go back ten, twelve years ago, everybody was focused on the computer or how data was processed. Today everybody understands that the competitive advantage, quality of life, comes out of the information that you have. And that's where EMC has played such a big part. That's why the tagline says, "Where information lives." We want to be regarded as the people that hold this precious information. And it's very clear that while processors and computers may go out of style, that the information isn't going to go out of style. And the information we collect today will be useful in the future, just as it will be very important to be able to collect the information in the future also.

DSM: And we want to honor the people who have the insight to see how to best apply that.

MCR: That's right. And with the new EMC award, we're really looking for the opportunity to honor some of the other people who have had the foresight to see how important information is and will be.

DSM: Thanks again. We really appreciate it.