

# MITRE Wisdom Oral History: Robert Everett

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**Krista Ferrante:** Welcome to MITRE Wisdom. My name is Krista Ferrante, and today we're at Robert Everett's house on the Cape. Thank you for joining us today. The first question I wanted to ask was what was it like to work at MIT on the Whirlwind Project?

**Bob Everett:** It was a wonderful experience. We knew that we were doing something that was really unusual and that would have a tremendous influence on the future. And there were all kinds of difficult questions that had to be dealt with. We had a boss, Jay Forrester, who was really a superior guy. And we knew that it was gonna be a success. And it was a combination of asking you to really put out and solve these questions. Seeing the computer grow, to see the other work being done in the business. It was very different from SAGE, but a wonderful thing for a young man to be involved in.

**Krista Ferrante:** So one of the main innovations of that was the magnetic core memory. What were some of the, what was it like to work on that? And how did you guys come to that as a solution?

**Bob Everett:** That was an invention of Jay Forrester.

**Krista Ferrante:** Yeah.

**Bob Everett:** It was a long road to turning that invention into a workable system. But the demands were for memory in computers. And the other things that people were working on, microwave tubes and cathode ray tubes, and so on, for memory, not only were difficult to make work, they didn't have a lot of reliability, but also their limited capacity. You take the first computers would have 1,000 words of memory. And now, they're billions. Your phone has got billions of words of memory. It was the very most urgent problem for computers. And Jay's solution to that was really what made the computer business go, in the early days. When we got the kind that we use now, chips, then of course it was all different. We had to get the right materials, we had to find ways to make core bytes in a reasonable fashion. We had to have all the testing, all the drivers and so on, for the working memory. So, it was a great job. And I spent a lot of time on it. If it were not for that, we would not have been able to do SAGE.

**Krista Ferrante:** Right, because SAGE required the real-time, fast computing.

**Bob Everett:** Yeah, and had a lot of it. A lot of it and highly reliable. That was the unique thing for Whirlwind, anyway. Everybody else was building what were called number crunchers, and solving equations and markings of a chart occasions and things. And we were the only ones who were working on a control computer. Which demanded high speed, high reliability, and lots of memory. In a way, Whirlwind is a beginner, a

antecedent for most of the computers. Most of the computers we have are control computers of one sort or another. There's still number crunchers, they do important work, and they cost a lot of money. But the millions and billions of computers that are around, and there are more and more all the time, in my opinion, really, descended from Whirlwind.

**Krista Ferrante:** So, around 1956, there was a decision to move the Whirlwind Project from the Barta Building on Massachusetts Avenue in Cambridge, closer, or onto, near Hanscom Air Force base, in what's now called Lincoln Labs. Can you talk about the move and the creation of Lincoln Labs and what it was like to work in Division Six?

**Bob Everett:** What happened was, there was suddenly a great need for better air defense. And the Russians had some airplanes that were copies of B-29s. And they had developed atomic bombs. And suddenly, instead of being thousands of miles away from anybody that could do anything to it, we had a way for an enemy to attack us and do enormous damage and kill lots of people. So, a very high priority job. This left a lot of work in a lot of places. But George Valley was running a Air Force Scientific Advisory Board study. And he wanted to have lots of little radars so he could have low altitude coverage. 'Cause there was concern about airplanes coming in at very low levels, we couldn't see 'em. And to manage this, he needed a computer, some system of bringing in lots of good data from lots of radars into a system where which would make sense of this. And he needed a computer. I can't remember but, I can't remember anything anymore, but I think it was Gerry Weder, who introduced him to Forrester, and Forrester had the computer and he was looking for a job for it because the Navy, which had paid for the development of Whirlwind wasn't at all sure what they were going to do with it. And so suddenly, there looked like a big possibility of doing something wonderful. And this led to a study, an internal study, which was done at MIT, but it had lots of people brought in, and a decision to go ahead and work on this. And MIT said they would start a laboratory to work on this problem based on the way they had built the rad app during the war. But they didn't want it on the campus. So, the plan was to build a new system out there, in the Lincoln Lab, which still exists. And with the tech responsibility for the development of this thing. We were involved in the Weber building and the Barta building on the campus. But these did not have the space required for this very sizable operation. We started out on the campus, where Whirlwind existed. MIT not only took us, that is the parts the we're working on and everything, but various and sundry other classified things that were on the campus, and moved us all out to Hanscom. We're still part of MIT, but it's not those war mongers, not on the campus. So the first decision to make that was about 1951, when Lincoln was created. The first building that they put it in, put up on Hanscom Field to house Lincoln, was several years later. And then they built subsequent buildings. And as these building were built, we were able to move more and more out to it. Eventually all this activity ended up at Lincoln. And Lincoln is still there, doing lots of wonderful things.

**Krista Ferrante:** What was it like in the early days at Lincoln Labs? I mean, was it similar to being on MIT campus? Did it have a different feel?

**Bob Everett:** Well, in the first place, we were on the campus, but we were on the edge of the campus. If you were on the campus, then you had to deal with buildings and power, all kinds of rules that covered laboratory activities on the campus. But we were up at Massachusetts Avenue for a few hundred yards, across a railroad track. And so we had our own people that looked after our buildings and our people. We had our own machine shops. We had our own personnel department. So we were pretty much a different operation appended to it. So when we moved it out to Lincoln, actually our service, the Whirlwind servicemen went with us. Lincoln had its own services. We had our own services, the Lincoln SAGE. This was a source of some argument. When you've got a tremendous priority that comes with something like defending the United States from nuclear attack, all these things which ordinarily cause a lot of trouble, disappear. You know, you say, well, we're doing this wonderful thing, and we need this. And they say, alright. You're always asking for things, but you can have it.

**Krista Ferrante:** And by services, you're talking about the electricity that went there, as well as the...

**Bob Everett:** Oh no, it went well.

**Krista Ferrante:** HR and yeah.

**Bob Everett:** We used Cambridge Electric We didn't manufacture our own. Although we had motor generator set that separated the computer from the necessities of life and a lot of the main business. I don't know, does that answer your question?

**Krista Ferrante:** It does. The next question is about the next transition from Lincoln Labs to MITRE. What was it like to work at Lincoln when they decided to create the new company to run SAGE?

**Bob Everett:** We did not foresee the continuing job of maintaining a thing like SAGE. Which is, you didn't make it and then give it to somebody to use. It was software based and it needed changes all the time. The weapons changed, the threat changed, the procedures changed, the training changed. And somebody had to force it to look at the design of the whole thing. Which is what we were doing. So, when it became obvious to us, and us includes the Air Force, that something had to be done about this in the long run. MIT had agreed only to oversee the construction of what was called the First Module, which consisted of three direction centers and one command center. First of all, they had people talk to MIT about doing this on a continuing basis, and they said they didn't wanna do it. And you can understand why. But then, the job is there, and it had to be done. So, the Air Force looked into all kinds of things. They asked the telephone company to do it. And they said no. They talked to all of the contractors who worked on SAGE about picking one of them to do it. And nobody wanted, a lot of them wanted to be the one, but nobody wanted to have somebody, one of their competitors, telling them what to do. So, they wouldn't do it either, that didn't work. So, finally they came back to MIT and said you've got to help us. MIT then, this was a major decision. Jeb Killian had been President of, head of MIT. And he was

followed by, I can't remember his name. But anyway, their decision was to spin it off. So we knew while all this was going on. And we knew about the decision. And we knew we were the part that was to be spun off. But then, we never paid an awful lot of attention to the rest of Lincoln anyway. So, it had to be done. And we were willing to do it. There were lots of decisions to be made about what the company would be like, and who would run it, and what they're gonna. But basically, the technical people from the SAGE program at Lincoln agreed to go to a new company. It really wasn't much of an issue but it was gonna happen. We took a few people from the other parts of Lincoln, like radar experts, and so on, and Lincoln kept some of the pieces of our basic computer work. Which I didn't like very much but had to put up with. They had the new rules. Deciding about paying people and how do you handle the pension system? MIT had their own pension system. How was that to be transferred, if at all, to the new company? A whole bunch of problems with us. Which we had to deal with. So it was part of the job. I've only had one job my whole life. I came to MIT to go to graduate school, and to serve the lab in Whirlwind and SAGE and MITRE. It's all one job.

**Krista Ferrante:** So, I've seen some records about this and the naming of MITRE. Can you tell us about the naming of the company?

**Bob Everett:** Well, I've been asked this question many times. It was named by Jim McCormack. Jim McCormack was a retired Air Force general, a man of great capability, who was the Vice President at MIT, and who got the job of setting up this thing, this MITRE. He said, and he swore he went through it, he wondered about this and he looked through the dictionary, and he came across a bishop's mitre. And he thought, it looks like a shield. And this is a defense program, so wouldn't that be a good thing to have, you know? So he named it MITRE. And I heard of this, and I said, my god, I can't believe they're gonna put MIT in it. But it's great for me.

**Krista Ferrante:** What was it like to work throughout the 60s, and the 70s and 80s, at MITRE, your tenure there? What was it like to be the president of the company after being the first tech director?

**Bob Everett:** As I said, MITRE was formed to do the air defense job. But we knew that that wasn't a permanent job. For one thing, the ICBM game along. And suddenly, our program, which said you could have anything you wanted, to maybe no. Also, we didn't think of ourselves as a air defense program, outfit. We thought of ourselves as a computer-based information system outfit which did air defense, and which everybody has an information system. Everybody needs help. So our view was, we were gonna go. It took a while for everybody to understand that. I remember the discussion in the board. I was not a member of the board at this time; I was Vice President for Technical Operations, which was essentially all the company. So I was talking about, to the board, about how there are many opportunities. So they said, why don't you write down something about this? I got my gang together and we worked to talk of opportunities that we saw and how it would be good. And this came out to be a company of about five times the size of the existing company. And so I wrote this all up and gave it to the board. And they said, what? Are you crazy, man?

Blah, blah, blah, blah, blah, blah. Finally the chairman, who was a wise old guy, he said, well, we did ask him. So, don't get mad at him. Anyway, so a large measure got new work of the same kind, of this basic structure that we had. And as the air defense business died away, we could grow and do more things of that sort. That took a lot of work. And the Air Force was very nervous about our going into all these things because they thought they'd set up this organization to help them with air defense. And why were we doing all these other things? And that was a real problem for many years. MITRE is still growing, still working for different people. But still the same basic idea. Another problem we had was we had lost most of the technical basis, which had stayed with Lincoln. And we had to grow our own. And that was very difficult to do because that costs money and people were always saying, oh, well we've got labs through the Air Force. They've got labs, Lincoln Labs, I'm sorry, why do we have to pay you guys to do research? And I would say, I know the people at Lincoln, we know them, they're friendly. If we have a problem and talk to them about it, they'll tell us anything they know, but they won't stop what they're doing and work on it. We need some people in the house who will work on our problems. And they have to be good enough, the knowledge of the technology. And this was a big struggle. But, MITRE now has good, solid, technology base. I think it's that they still think it's important.

**Krista Ferrante:** Can you talk about working with the Board of Trustees, and in particular, Dr. James Schlesinger, and what it was like to work with him, even if there was some overlap. Well, there were a number of board members. Generally very fine men. More recently, women, but not in the early days. A number of board directors, board chairmen. And they had to be dealt with. Dealing with Bob Sharpie. And I would talk to him about what my plans were for the salaries of the senior people. And when I'd go in and talk to him in his office. First of all he would tell me, what he's paying his people at Cabot, always a lot of money. And then he had bonuses that he would give to the people. And I would tell him that he had to take those into account and not just compare my people with his people's base pay. But he said that it was different. And I said that's not different, this is pay. Anyways, we had this fancy dance that we went through after everybody'd had his say, we'd get down to business and solve the problem. I did not work with Schlesinger. That was when Charlie was president. But Charlie and I talked to each other and said he'd make a great Chairman. So we invited him to dinner, now that I remember it. Took him out to dinner and talked to him. And he started out not wanting anything to do with MITRE. So we gave him a big sales pitch about all the wonderful things we did, what we're trying to accomplish, and so on. Brought him around to believing that MITRE would have been a good thing for him to do. And he made a superb chairman. But, like I say, I didn't have to deal with him. You should ask Charlie if Charlie were around.

**Bob Everett:** Well and he stayed around James Schlesinger for a good long time on the board.

**Krista Ferrante:** Yep.

**Krista Ferrante:** One of the people that you started working with at Lincoln Labs that came over to MITRE, was John Jacobs. Can you talk about your relationship and talk about John Jacobs?

**Bob Everett:** Well, John, he came to us after the basic work on Whirlwind had been done. And the design work on SAGE had just started. We'd gotten many of our people, who had been in the war and done technical jobs like radar technicians, and so on. And who had Bachelor's degrees, went into the war, did a senior job, came out and went to MIT to go get a graduate degree. Many of them married, with families. MIT built a bunch of buildings to house these people. And we got a lot of them. In fact, it annoyed the professors on the campus because we had this lovely computer job and it was very attractive to the graduate students. And so, Jack came to MIT and he went to work in the research lab for electronics. He wasn't very happy there and he heard about our work, and he came over and asked about it. He was obviously a first class guy. We took him. And he played a very large role in the design of SAGE. Forrester was the boss of Division Six. I was sort of right hand man, I guess. When Jay left, I was astonished when he left. It was 1956. We were right in the middle of getting SAGE going. And suddenly, he says he's going back to the Institute and teach. Why? Well, all the interesting things in the computer business had been done. So he was gonna do something different. Only Jay would've taken that position. Anyways, he left, and he left us, he left us with a job and all those people and everything. So we carried on as best we could. Jake was a very senior man in that stage of the game. So, no question about his going to MITRE. He was my right hand man. He did many good and wonderful things. And then he came down with Parkinson's. The worst decision I ever had to make, being a manager, was to tell Jake he couldn't be a Vice President anymore, 'cause he couldn't do the job. But he was a great friend as well as a comrade. Probably never got the credit he deserved.

**Krista Ferrante:** So, as MITRE evolved, so did the federal research and development model. And in 1976 there was a big change, and the Department of Defense decided to redefine the federal research and development centers. You were President of MITRE at the time. Can you tell us about working through the change?

**Bob Everett:** There were a goodly number of these federally funded, which to the Air Force were FCRCs, federally research and development companies. And there were some of them who had happened for all kinds of reasons, like RAND was spun off from an airplane company, to make it separate from the company to do things that you don't wanna give to a profit-maker competitor company. There were the atomic energy laboratories. And they all somewhat separate rules that they had worked out. And so, this has been a problem that comes up all the time, and not just in the middle of the 70s, there were debates since the 60s, through the 70s and the 80s, and there have been, I understand, from now there have been a couple of reviews on the whole thing. Because there are these organizations, and they added up to a lot of money. And so it's appropriate for the government to look at the question of whether this money is being properly spent. I think we had something substantial to do in setting up the process and rules for FFRDCs. And I don't think they've changed very

much. But they are, from time to time, brought up. And usually they come out all right. But sometimes there is a big fuss about it. And that's the job of the various companies to defend their process. Which we do, and I assume all the president after I left do. And Al does. And Al's successor, whoever that is, will have to put up with that. But I think the fundamental purpose of the thing, it sits on the government's side of the table, and supplies first class technical help and does not compete with profit-makers, doesn't manufacture stuff. They're non-profits, they don't make money. Once you start making money, some interests other than the government had had. And I think that set of things makes a good prospect. A good purpose and a good foundation. There's an infinite number of odds and ends that have to be settled and worked out. Which happens because it's fundamentally a very important thing. The government could not operate the way it runs now. My argument was always that the government started out and had to have people working for it. When there was a political change, in the beginning what they'd do was fire all the guys from the previous administration and put in all your friends. That's understandable from a political point of view, but not very good for the operation of the government. So, the solution to this was to put in the Civil Service. Which meant, to our first approximation, that the old system fired everybody, every job, they say. Now you couldn't fire anybody. And if you can't fire anybody, you can't run a good operation. And that makes it very difficult for them to run first-class technical apps. There are good people in the company. But it's very hard to have a really large organization that will run. I don't know what other solutions there are, but this is the one we've come down to.

**Krista Ferrante:** In 1985 you gave a speech about MITRE's long term goals. And you stated, I'll quote, "millions of years in the future, "when the sun is growing cold, "the earth is turning into a desert, "and there's only one organization left in the world, "that organization will be MITRE." And that's obviously hyperbole, but you go on to say that the point is that MITRE will be a place that continues to provide value. Do you think MITRE's done that?

**Bob Everett:** Well we've certainly tried. And I think we've done very well at it. And we continue to do well at it, because the company gets stronger every year. And the quality of the people, and the quality of the work done, and the quality of our relationships with our customers, all that, in my opinion, should continue to, because I think the government, if there's one thing you can count on, there's always gonna be a government and it's always gonna need help. And MITRE's job, and the job of our sister organization, is to provide that help. That's what I meant by there're always gonna be governments and they're always gonna have information systems, and they're always gonna need help, and MITRE is there to provide that help. I don't know an alternative. There might be an alternative. You could change the way in which the government deals with its employees. And then you could build a thing. MITRE is a collection of technical people. You could have that group of technical people be organized as a profit making organization. But then they would find it difficult to make relationships with them if they were paying. A few years ago, a aerospace company, which is our sister spacesuit systems outfit on the West Coast, there was a serious attempt made to convert it

to a profit-maker. I didn't think it would work, and it didn't. But, maybe. Anyway, that's what I meant.

**Krista Ferrante:** Can you tell us about the day you made that speech, and do you remember the context?

**Bob Everett:** Yeah, we had a away meeting of the people in Washington, senior people. We went down to a place on the river in Virginia. I'd thought about it; I worked on it in the car on the way down. I gave it after dinner to assembled clients. It went over pretty well.

**Krista Ferrante:** Okay. This is more of an open-ended question, but do you have any favorite stories of your work and life during the time you were at MITRE?

**Bob Everett:** Say again?

**Krista Ferrante:** Sorry, do you have any favorite stories?

**Bob Everett:** Oh I've told you a few of them.

**Krista Ferrante:** Yeah.

**Bob Everett:** I don't know. I don't have a bunch of stories stored up which I can bring out to lather up my speeches. I think, from my point of view, I've been able to work with and know a lot of wonderful people, wonderful people at MITRE, and MITRE's board, and the Air Force and our other customers. Air Force officers are a bunch of really great people. It's a meritocracy. If you get to be a Air Force general, you've got something on the ball. And they're largely people that are trying to do right by the Air Force and by the country. And that's true, actually true, of other customers that we have. I've been on a lot of committees, Defense science boards, and things, which have always been fascinating. And once again, there're wonderful people. If you just sit in your office and work on your own problems you get pretty dull after a while, unless there's a catastrophe, or something or other, which your job in life is to prevent catastrophes. So, if you go off to Washington and work on something, and it's very often something you don't know anything about. I recently said it, phone rings, somebody's calling you up, said, Bob, we've got this bug study going, we need you. Well, in the first place, you may have been the fifth guy they asked. But you say, I don't know anything about that. They say, just what we need, fresh look. But then they'll teach you about that thing, so you're always learning things. Learning things one of the most valuable thing in the world. If you stop learning things, you stop being useful.

**Krista Ferrante:** And what would you tell someone new to MITRE about the company and about working there?

**Bob Everett:** It's the nature of MITRE as an FFRDC, that you can put the job first. The way it oughta be, and I think the way it is at MITRE, is you have a job of helping the government do things and this comes in various layers, and whatnot. But your job is not to get a new job. Not that we



prepare proposals. Once again, I can speak only the part that I was familiar with. We did look for new work. And it took the form of people at MITRE getting to know various people in the government, and being helpful to them. And after a while, that help turns into necessity. We've had success in setting up separate FFRDCs within MITRE, so MITRE's really a collection of Fs. And that's one of it's strengths because we have lots of good people across our whole thing. And if somebody with a small job but has a problem, he can get help. And MITRE is set up in such a way that you'll get help. We had problems in the early days about somebody with a division wanting to keep his own people. I understand that. 'Cause the good people that will work for you and make you look good, make your department look good. But it has to be, the job comes first. And that will, in fact, protect you. And you can spend your time on that instead of looking for work, or writing proposals, or dealing with things. So you should learn. You should learn the new things 'cause they're changing all of that.

**Krista Ferrante:** So I have one last question. What was it like to meet President Bush and receive the Medal of Technology?

**Bob Everett:** I was overwhelmed and delighted to receive that award. It's an unusual thing. So, I know I was thrilled to go to the White House, be given a fancy award. That's probably the crowning one among a number that I've gotten. I remember, Bill McCune, who was the President of Polaroid. He was our chairman for a while. He said, he finally, retired, I guess, and now I've got some time, nobody asks me to do anything. You know, back when I was busy, they asked me all the time. Now they don't ask me. And there's some truth to that. Well, everybody does what he can. Usually, nobody says much to you while you are doing it. And after you've done it, they come around and say, isn't it wonderful? Sometimes they say that. And then they give you awards. But you're not doing anything useful. You do the useful thing before the award. It's better to do the useful thing than to get the award.

**Krista Ferrante:** Well, thank you so much for your time today. Really appreciate it.

**Bob Everett:** Well, it's delightful to be asked. I like to talk, like everybody. And these are nice, you're very nice, come all the way down here to the Cape to talk to me.

**Krista Ferrante:** It's our pleasure.

**Bob Everett:** I think what you're doing to get people to talk about MITRE, and how it should make a great collection of things.

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