An Interview with

SUSAN K. ("KATHY") LAND

Conducted by Jeffrey R. Yost

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Kathy Land Interview

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Abstract

Computer scientist Susan (Kathy) Land discusses her career in software engineering and senior managerial roles with U.S. Department of Defense and various defense contracting organizations—Missile Defense Agency, TYBRIN, BTG, Northrop, etc. The bulk of the interview concentrates on her expanding volunteer roles at the IEEE Computer Society, and particularly her leadership of the organization in serving as its president. Among the Computer Society topics she discusses are efforts to better serve IT professionals, strengthening managerial controls and responsibilities, commitment to international efforts, the important work at local chapters, conferences, standards, and cooperation with the parent organization, the IEEE.

Yost: My name is Jeffrey Yost, from the University of Minnesota, and I'm here today in Huntsville, Alabama with Susan K. Land, Kathy Land, and this is an interview for the Computer Society for the CS Leaders Oral History Project. It's Friday, September 3, and I'd just like to begin with a few basic biographical questions. Can you tell me when and where you were born?

Land: I was born in Memphis, Tennessee in 1963. So it's kind of interesting; I think I was born in the right region of the country, at the right time, because I think that if I'd been born 30 years earlier I would've been extremely frustrated. You know, being a woman in the South. But at the time when I was born it was very full of opportunity.

Yost: Did you grow up there as well?

Land: Yes. I grew up in Athens, Georgia, where the University of Georgia is located. My grandfather was a professor at the University, so that's all I knew—that sort of academic, college town. Then I moved to Columbus, Georgia for a brief period when I was in high school, and then went back to the University of Georgia for college.

Yost: In your pre-college days, were there particular subjects in school that you were especially interested in?

Land: Math and science, but really, math - it was interesting; I'm giving a talk in Raleigh next month, about when and where I grew up. I don't know if it was where I was raised, but going to college was a novelty for women. Now I had aunts; and my mother went to college; they were the first in our family to go. So I had that example but certainly, women were not encouraged to perform well in science. But I had some really great teachers, and I think it was because I was in Athens.

Yost: And at the University of Georgia, did you know what you wanted to study from the start?

Land: No. I had this kind of meandering path to my college success. But I think a lot of it is that it's just hard work and being in the right place at the right time, right? You get lucky. But then you take advantage of that break. So I got my degree, my original degree is in education. So I went to school and I didn't know what I wanted to do. I knew I wanted to get out of college; my plan was to go to Europe and do something overseas. I was not interested in getting married. You know, my friends were looking for husbands. I did get married; I did find my husband; we went to Point Mugu. But my first job was with the Department of Genetics. They had a mainframe and I was the only one who could figure it out. So that was my introduction to computer science. And then at Point Mugu, to get a job with civil service, initially, I had to learn how to type. I didn't know how to type. Because the only positions they had out there were for engineers, so I took a job as a clerk and they came with this new series of computer specialist, and then a computer systems analyst; so I basically ran the missile test lab for the Phoenix missile

way back in 1984 or 1985. That's when Macintoshes were really hitting the market. You know, the Mac. So I started a Macintosh users group at Point Mugu, and really it ended up going DoD-wide because we got all these Macs. I figured out a way to work around the procurement system at the time I was running the lab, and I got the Macs for the engineers because they were great design tools. But nobody could figure them out; remember how glitchy they were? Do this, hold your mouth this way, and then it might work, right? Reinstall, uninstall; so I started a user's group just to basically say here's how you fix this issue; here's how this one works; you know, whatever. Here's this new piece of software that's really cool; 'cause everything was new, right? And so I ended up having I think 10,000 users. This was no e-mail/electronic newsletter, right? This was mimeographed, mimeograph machines were still around; and big, huge copiers. I did everything. I copied all the newsletters and then mailed them snail mail. You know we had DoD pouches, but; I tell this story; so I'm running this user's group, I'm doing my job, and then I get this call from the secretary of the admiral on base. The top guy, right? You should never get a call from the admiral's office. And his secretary said that he wanted to see me to discuss this user's group that he'd heard about, and to see a copy of my charter and my membership list. And so went oh, wow, what's a charter? [Laughs.] I quickly figured out what a charter was, put one together, and then had a copy of the people that I mailed to, and went to see him. He was top leadership; you know, I was 21, right? So I was very intimidated. But I think it went well. I had no idea if I was going to receive a pink slip or what. About a week later I got a letter of commendation from his office, and that's still on my office wall because what I learned from that is yeah, it's risky to lean forward but you know it will pay off.

Yost: Moving back for a moment, you received a Bachelor of Science Education?

Land: Right. So I leveraged that; a BS was a BS back then, right? So that was a smart thing; I had a Bachelor of Science degree. I went back to school in 1992 to University of West Florida. We had moved to the Eckland area, from California, which is in the panhandle of Florida, and I worked at 46 Test Wing, and so I needed to go back. Computer science was really evolving. Then they finally had courses you could take. - When I was at University of Georgia, the year I graduated is the year they developed a computer science program, so I missed it. I wasn't about to go into computer engineering or whatever that class was where all the people were walking in with their big stacks of punch cards. That just wasn't going to happen for me; it had no appeal. But I went back to school and took data structures, and algorithms, and blah blah blah, and all the programming. At the time it was PASCAL. All those courses. And then two years ago, I finally got my master's degree in Program Management IT. I've been doing other things. [Laughs.] Sort of do school if I need to supplement my knowledge.

Yost: So you mentioned a Macintosh User Group newsletter. How wide a circulation was that, did I understand right, 10,000?

Land: It was DoD, right? I mean, it was civil service based; different military bases across the country and Hawaii. And I had I think it had about 10,000 members when I left. Yes, it was ridiculous.

Yost: That must have taken a lot of time to produce.

Land: Yes, I had a great boss. The good thing about being a good computer systems manager is that if you're doing your job well, you have free time, right? Things aren't falling apart all the time. So it was good; I supplemented what I was doing with that.

Yost: Can you talk about your introduction to the Capability Maturity Model and what that meant for the work you were doing?

Land: Sure. So that sort of paired with my introduction to IEEE and the Computer Society. You start out in computer science and you're either going to go into systems management, where you're in like a DBA or a systems manager, IT person; or you're going to go into programming. So I went into programming and I was working on a project with a company called BTG. BTG has since been purchased. And Ed Bersoff had founded and was president of BTG. Bersoff was interested in process improvement. And Tom Hannon was a member of the senior staff; and Tom came to our site; and at the time I was a program project manager and we were tasked with; the way it used to work with business development is you would bid on an effort and then they would dump it over; they would turn it over to all the developers and they would go okay, oh by the way, you're on the hook for requirements specification, and a design document. You have to remember that none of this was taught in school, where we went; where I went; where any of the people on my team went, because we were all like a hodge podge of people

that really liked computer science and we were really good at what we did. So we were on the hook to do this stuff, so I turned to IEEE, their software engineering standards. At the time, they had these guidebooks that would give you the standard for requirement specification, and then a guidebook. So it would help you and I used that as a tutorial type of thing to train the people on my teams. You guys take this, and you look at the design and figure out how we're going to do that. From that; the Standards Committee at IEEE decided, in their wisdom, to do away with the guidebooks. It was too much trouble, they were always out of phase, and so I talked to Tom. What are they doing? They're insane. This is the most valuable thing, you know. Don't they realize there are practitioners out there? There's the academic community and then the practitioners. Practitioners need this stuff; they don't know it. He said why don't you write a paper and submit to this conference? It was the International Software Engineering Standards Symposium. John Harauz was the guy who ran the conference, and he was an Ontario Hydro engineer; and he's retired now,; and Paul Croll; all these people who are kind of like big names in standards really kind of listened to this young person; I think I was maybe 26, you know. What are you all doing? They said why don't you conduct a survey? I said I can prove to you that this is of value. I said I'll conduct a survey, and so I surveyed all the members; do you use standards, how do you define their value? That drove a lot of the direction of the standards; that Software and Systems Engineering Standards Committee. And that's where I got the inspiration for my books and different talks. So my introduction to process improvement was really more as a training method. What's the right way to do software engineering? Now there's curricula in schools, but that's been driven in a large part by the IEEE Computer Society. In the beginning there

was none of that and there was a real need. And there was the need for people to understand that engineering is engineering - is engineering. You know, like right now, I'm the chief engineer for MDA BC/BMC, right? It's the same engineering that we were doing in 1940. Software engineering is nuanced and there are some differences, but system, software, whatever, there are certain principles that you apply.

Yost: I had the opportunity to meet Watts Humphrey, years back, and talk to him about the early years of software engineering. It's really fascinating how ideas on software engineering evolved in the early years.

Land: Oh, yes. They did a lot of really great work and I really admire him, and what they were able to accomplish. I still think software engineering as a profession is not recognized sufficiently so I hope we can continue the hard work.

Yost: Early in your career, at BTG, what was the environment for the women, and moving up the ladder to become managers, to become leaders?

Land: I'll start at Point Mugu.

Yost: Great, I should have asked about there first.

Land: At Point Mugu there were two women who were not secretaries. Me — I came in as a clerk, but I was a clerk for 30 days, so I knew I was coming in with the intention of

getting a job with the government but it is this Rubik's cube of job placement - how do you get your foot in the door — and then one other woman, and she was a Ph.D. mathematician. We were the only women at the lab on the beach. And the lab was the AMRAAM, the early standard missile (SM2), this; and then the Phoenix missile. So the AMRAAM was this bright idea, Phoenix, and the standard. I worked in the standard Hardware in the Loop (HWIL) lab, and my husband worked on the Phoenix, and the AMRAAM HWIL labs. So it was great. I think technology was wonderfully great at stripping away gender. I had somebody yesterday; it was funny because we were talking about; somebody came in my office and the way I am, I'm very focused and one of the guys on my team came in and said, "You're just like a guy." [Laughs.] I said well, I come by it honestly; the years and years of working with men, right? But I think if you go in expecting to have favored treatment or whatever, then you're going to have issues. I only have one story, and I told this at a talk I gave three, four months ago; so I was running this user's group and we had a big; picture a 1950s-looking base, very antiquated; and the auditorium is like one of these old amphitheaters where the rows go down and so the speaker is standing in this kind of pit. So I was conducting a user's group conference, so there's all these men, right? And it's typical; they all have white button-down shirts, short sleeves; they're all engineers. And introducing the speaker, and at the end we conclude, and I said alright, are there any questions. This guy gets up in the audience and he goes — I learned to drop my Southern accent in California; I have it back, but — so picture, I'm like 21, blonde, and real Southern. So he said well, I don't have a question little miss, but I sure do like the way you talk. I just looked at him and said if you could just hold that thought, please, I'll get back to you. So I answered the rest of the questions, then I

came back to him and I forget what I said but it was like one of these life epiphanies where you have the right amount of wit at the right time; but basically, something like "honey chile, your mama didn't raise you right." I mean, I just poured on the Southern drawl and at the end, there was this quiet and then everybody just got up and started clapping. So I got a standing ovation. I never had a problem after that. But on a serious side, I did work in a lab. I worked in the Phoenix lab and then I got a promotion to another lab, and it was with a guy — and I won't name him but I still remember it — he did not want a woman in his lab. Picture like, this was a top secret environment; behind a cypher-locked door, right? So you go in and you lock the door on the inside, there's one phone. He didn't talk to me like for two weeks. And then one day he came back from lunch and just locked the door and just started screaming at me and telling me how; what right did I have to be in this lab. I waited until he calmed down and then called the lab next door and told them to come rescue me. And then got another job right after that. That was kind of my only bad experience. And so I worked at TASC, Northrop Grumman, TYBRIN, MITRE, and now the government again.

Yost: And Accenture?

Land: Accenture, right. My joke there was that it was not a job but an 'accenture'; what an adventure that was; it was a year. I changed jobs because of limiting opportunities, and I think that's not gender specific. I talk to people around here; three of my guys on my team just jumped to go get promotion opportunities because in the government right now

it's extremely limited if you're a young engineer. But if you don't do that, you don't get promoted. So part of how I got to where I am today is I took the risk and changed jobs.

Yost: What year did you become a member of the Computer Society?

Land: Golly, like 1990-something like that.

Yost: And do you recall some of the first roles you had with the CS?

Land: Conferences; came in through the Standards Conference, and then they asked me to be their publicity chair.. And then I was on the steering committee; and then I got involved on the software standards committee; and then I was on the board for Computer Society Standards; and I was the VP for Standards. I'll tell you a funny story about the standards group. I would say 98 percent of the people in the IEEE are great, and they're mentoring and they're enabling and wonderful; but there is a group, and I don't know if it's unique to standards, but really, you know, knowledge is power wherever you go, right? So if you're in technology you realize that. So I'm on the Standards Committee, and I got my foot in the door, and I'm a member of it. And they all sit around the table and it's all the different standards sponsors. It's not just the software standards I was familiar with, it's the education standards, the wireless standards, everything. Nine hundred standards is the active pool, or whatever. So they start talking and they'd be like '1490' and '1582', and that's how they talked about the standards. I'm going 'what are you all talking about'? We could bring our computers in so I put together this big

spreadsheet. I read every standard that I could get my hands on, right. And it was my cheat sheet. I had the number, I had the name of the standard, what I thought of it, what stage it was in; so they thought I knew what I was talking about. [Laughs.] But I showed it to them a couple years later, and a version of that is what they use today to track everything.

Yost: So with the standard setting work, obviously, standards can have a positive impact for some companies and organizations.

Land: Right.

Yost: How is that dealt with, to keep in check a bias toward a particular standard beneficial to one's organization, is it just openness, full disclosure [pause]

Land: So, like, working on a standard?

Yost: Yes.

Land: Okay. So here's an example. There are some print standards. If you worked for a company and have somebody who's on the standards board, for like Lexmark, well you have a vested interest in affecting that standard. So you disclose that. There are also different; and the Standards Association within IEEE, there's a consortia-based group, Industry Standards and Technology Organization (ISTO). ISTO is the consortia-based

group where you actually go in and you say ‘I am a lobbyist for this group’; or ‘I have this vested interest; or ‘this is my company’s standard, we want to get it through’. On the other side the ethical way to behave and you declare it (or you don’t, but it’ll all come out in the wash). People know who you work for.

Yost: So at BTG, you participated in an audit level three [Capability Maturity Model].

Land: Right.

Yost: Can you talk about that?

Land: Yes. So I did that at TYBRIN, where I worked before; and I did that at BTG. It was interesting because to me it was just every time we would roll out; even at MDA, right? Because I just did some stuff for MDA, but it was acquisition kind of policy stuff; software. It’s amazing to me that people; just miss the fundamental basics; configuration management, what a novel idea, right? I mean, these are companies that have been developing software, are supposed to be experts in their field, and they don’t know what they’re doing. They really don’t. You go in and developers are writing over each other’s code; the quality stinks; they’re not doing adequate testing; all kinds of things. I would say at BTG it was a challenge because they really didn’t have the diversity of projects that really were required to do the audit. We did it, and it was successful, but it was harder than the one, say, we did at TYBRIN, because they had such a wider variety. They really did more hands-on software development.

Yost: How would you compare the working environment at BTG with Northrop Grumman, where you moved in 2000?

Land: I think it's hard for me to compare the environment. They were both great; I had tons of opportunities at both companies. But I would say my maturity, right? I finally figured out what I want to do, which was to do some management and get out of development. And that's I think what made the difference, for my being able to sort of rise to the top. I decided I wanted to.

Yost: So at BTG you were managing a small group and that became much larger at Northrop?

Land: Right. I think maybe it was a $16 million effort at BTG. Then at Northrop, it was larger. I was actually charged with; they moved me here to Huntsville and my charter was to start a software engineering department and I came to Huntsville and I had; this is kind of the epitome of the good ol' boys network, right? And I had no contacts, and one developer, and I had to fire him because he wasn't any good. But in 2-1/2 years I had like $25 million in business across a variety of projects and then about 20 staff.

Yost: So you were frequently hiring people.

Land: Yes.

Yost: Can you talk about the skills you looked for and what makes a good software developer, a good software engineer?

Land: Right. So it's really hard because everybody's resume looks great and people can talk the good talk, right? But you get somebody onboard and they don't know what they're doing, right? So one thing; and if there's a loophole, I'm gonna find it. So what I would do is I would hire temporary, consultants, and then insource them if they were good. That's typical; and I had people that teleworked, way back when people weren't; I had people in Colorado Springs, all over. You know, word of mouth; this guy's really good; and then eventually would hire them and move them to Huntsville. The shortest person I ever — like the shortest employment — I had a guy who was a consultant, and he walked in; he was supposed to be a Java expert. I walked to his desk and he had *Java For Dummies* up; so he got escorted out. He didn't know what he was doing. So, it's dog eat dog; you either know it; and that's why I love technology. It's you either you know what you're doing and you're good, and everybody realizes it; or you're not, and you go find something else to do. So it's the great equalizer.

Yost: Were companies like Northrop Grumman, except for kind of testing people out as consultants, were they outsourcing much to specialists like Computer Sciences Corporation, or IBM, or was it all internal.

Land: No, that's kind of a new phenomenon, right? Used to be that everybody thought, you know, I'm gonna compete against you, Boeing; we're gonna win this and we're gonna be sole source on it. And now everybody partners. You know, these giant contracts where you've got a mixed team from different companies. They might have different expertise. But then, you know, Boeing might have one expertise; Northrop has the other, so. You can argue it's a good or bad way to do it, I don't know.

Yost: What were some of the important projects that you oversaw at Northrop?

Land: I'll get back to; so, Tybrin, okay; 46 Test Wing, there's a flight performance software so the pilots have this software that helps them plan their flight, plan their trajectories, and their stores loading, and all that kind of stuff. So when I started there, all of these different products had interfaces with each other and they had no; none of them worked together. So my job was to make sure that all those interfaces worked together. So that was pretty interesting, and that program really grew. We started out with one little product and then now it's just this huge thing; Airport Standard. Then I went; at BTG, it was called Automated Vehicle Monitoring and it was; it's deployed at; one thing I think is really cool is that a lot of the things I've worked on are actually in the field and working still. So AVM is deployed in the Washington area, and in Texas, and New York. So basically, these big busses that have all the computer monitoring on them, they monitor the route, they monitor the fuel, the oil, all the engine stuff. But also how many times the wheelchair lift is deployed and raised, and if they're on route or off route. Very complex. At the time I did that, I was a database programmer and it was awesome.

Probably one of the best jobs a DBA could ever have because of all the complexity that was on the back end, and all the calculations. So that was one; bunch of little incidental things. Let's see. After BTG; that was the big one at BTG. There were several others. Weird projects; like one was a hazard analysis tool. Early, early; like where in the country are you likely to have an earthquake, for the military. But if I put something — we never knew what — but if I put something here in this region, what's the likelihood of nuclear fallout or a tornado? You know, those kinds of things. And it was web based. After that, Northrop. Oh, Northrop was a lot of different projects because, you know, I had my own department. But the big one that I was the program manager for was America's Army. So America's Army is like a massive multi-player on-line game and they'd never been able to successfully get out a launch; a decent launch. So their big overmatch, the release they're known for was the one I was the PM for. And that was, I had no life. When I left Northrop; I left because they wouldn't remove me from that. I'd been on that program for about seven years and I was exhausted. So I had to leave the company. But when I left I got a check — after tax — for seventeen grand, that's how much leave I had. I'd never taken any vacation. So, anyway. It was a great company and I did some process stuff for them, too, and rolled out a mentoring program for the company that I was really proud of. And then with MITRE, I did a lot of publishing; just a lot of analytical; analysis, you know, process stuff for the Navy, and DoD, and AT&L, that kind of thing.

Yost: Around the time you joined Northrop, can you talk about the types of activities you're involved with the Computer Society, and did you have any key mentors in the Computer Society that stick out in your mind?

Land: Yes, a lot of mentors. And we're still really good friends. Like I said, John Harauz; super great. Robert Dupuis; just got an e-mail from his the other day. Paul Croll, Jim Moore . There weren't that many women mentors. And there were some real SOBs. We had some problems on the Computer Society board with some kind of people that were there for the wrong reason. Same thing with the standards group, you know. If you're not here for the right reason then leave. So I think the Computer Society and the standards working groups today are much healthier than they were. I mean to be perfectly blunt because we call them "lunch eaters," right? They're not there anymore; people that show up just because they like to travel, that kind of thing. Trying to think if I had more mentors. That's about it. Had a lot of women colleagues and friends, but I can't remember a woman mentor.

Yost: Working in government and government contractor environments, how responsive did you feel the IEEE and the IEEE Computer Society were to members of these communities?

Land: When I was president, we really changed the focus. It was great because there were three presidents that were really aligned; Rangachar Kastori, Sorel Reisman, and me. And Mike Williams. So there were actually four. What we did was we said what

we're really going to try to focus on, how can we make the Computer Society the best for all of our stakeholders. So we hired an external consulting group to figure out who we really were as a group, and then developed some strategic planning and associated activities. To really stop being less of a club and more like we really are a responsible organization, responsible to our members. So there was, a big focus on industry. There's a pendulum that always swings back and forth. Right now, the pendulum's swinging back the other way. What's funny is the IEEE, we tend to be the leaders, honestly, Computer Society within the IEEE. IEEE is now like, certifications, and oh, we've gotta focus on industry, and we're going the other way, which is kind of psychotic but it'll all work out. So I feel like they were very responsive. I think they can do more; I think they miss a lot of the DoD; what breaks my heart is that in DoD, right, I've spent my career with brilliant, brilliant engineers. So all of that literature, all of that publication potential is missed. Is missed. For example, an engineer on my team, for whom English is a second language, but brilliant guy, he was my algorithms lead, right? So the algorithms group, command and control for missiles, right? Smart. He wrote a paper — I encouraged all my guys to publish — and he submitted it and it got rejected. So he reworked it and submitted it to a different — now, these weren't Computer Society submissions, they were all a variety of IEEE — and it got rejected again. What they failed to understand is that it has to go through a whole review process, whether it's Northrop Grumman or Missile Defence Agency, you have to check all these boxes with internal review before you even submit. So the IEEE peer review process really does not work well for people in my field because you get in this loop, right? Because it gets reviewed internally, then IEEE makes changes; then you get it reviewed internally again, and then IEEE makes; so

we have to do something better than, I think, more enabling than we have been because we're missing out. If we really are seeking the information leaders, we're missing a big pool of it.

Yost: Relative to ACM, would you characterize it as much more industry-focused and responsive to those in industry?

Land: I would say that ACM made educational or universities, that kind of thing, their niche. I would like to say that it's not either/or. We'd like to support the academic and the researcher, as well as industry. I see us as being larger than ACM.

Yost: In 2004, you were a member of the Distance Learning Committee.

Land: Yes.

Yost: Can you talk about the work with that committee, over the three years you were with it what it did how its focus evolved?

Land: Oh gosh, that was a long time ago. I think that what we were trying to do was develop a program to try to support practitioners, you know, as one of the first distance learning-type things. That's what I remember. I don't remember any specifics.

Yost: In that same period, you were a member of the membership committee and membership, I think, peaked with the dotcom bubble and has fallen off since. Can you talk about some of the activities of the membership committee to try and reinvigorate membership?

Land: Yes. We were always trying to reach out and figure out what our members want, right? What we do is we do a very good job of surveying. We don't do a very good job of responding, right? So you get a survey back and they say we're really interested in getting distance learning information, or just-in-time training, or; you know, all these things. And we don't offer the products. So one of the things we tried to do with membership at the time was to really partner, and there was a committee that was formed. And it was a board until this last board meeting, and now it's been dissolved, which I don't really understand. But it's the professional practices, which is really where all of the tools, and certifications, and training were in that realm at the time. We set up an arm of the Computer Society to try to make these things happen.

Yost: Between 2001 and 2005, you were a member of the Software and Systems Engineering Standards work group. Can you talk about some of the most important achievements in those years?

Land: When I was the VP, I got the Standards Medallion for this; it was for bringing in the EP, the Environmental Protection kind of standards for computer hardware, which if you remember, last year or the year before, they made Apple back down. They wouldn't

certify Apple products and Apple tried to blow them off. And Apple caved, right? And then there was another set of standards, I think it's FIPA, Foundation for Intelligent Physical Agents. I think; I don't know. I've been focused on so many other things. But I brought in two new sponsor groups, so that was a big deal. That's what I think we should do is to look how we can bring all these disparate groups under one umbrella, because that way, you know, you have a new area, you're supporting your constituency, but also, the competition's gone, right? They're part of you. But the other thing is that we really focused — Jim Moore led the charge on this — we focused more with leveling our standards or making our standards conformant [sic] to ISO standards, so they became recognized more internationally. It used to be the attitude was there's ISO and then there's IEEE, and IEEE is better. That's stupid. Let's work with ISO and let them put their stamp on our standards, right? So that's what we did.

Yost: In 2005, you became a member of the Board of Governors and served in that role for four years. What were some of the most critical issues you saw facing the Computer Society at that time?

Land: One was this kind of factional "lunch eaters" and the "non-lunch eaters," right? And there were; we were trying to effect change, positive change, and there were people that were opposed to change because they just didn't want; they just didn't want it. I don't know. There's the 80/10/10 rule. You know, 10 percent will actively oppose you, and 10 percent will lead the way, and then 80 percent wait to see what everybody's going to do. The key is to get rid of those 10 percent that oppose you. [Laughs.] I think there

was just some; the Computer Society was at war with the IEEE. I mean, how stupid. Anybody that understands basic organizational management understands that you cannot fight your parent. So I think there was the two critical things that we turned around, was making it a much more healthy, less kind of club board, professional board, one that really listened to our constituency. The other was repairing our relationship with IEEE.

Yost: What were some of the principle disagreements or conflicts with IEEE?

Land: Oh gosh, it's been so long; I mean, I'd really rather not dredge all that up. Basically, a lot of it was personality based. I think you see this sometimes when there's not enough for people to do, whether it's at work or a volunteer organization. People start turf wars. If everybody's focused on work you have a lot less of that. So that's really what we tried to do is just really turn things around and make it more of a working organization.

Yost: When you were nominated and became president elect, what were the most important issues to you, as you prepared for your year as president?

Land: My most important was to get; to make sure that everybody understood that we have an effective and trained board. They understood their responsibility. It wasn't a club. That we understood what our strategy was, what our goals were, right? All of the different board VPs had goals and targets. I mean, it was kind of a tough time to be on a board then because you had real things to do. You were held accountable. So that's really

critical; I think we made great strides getting diversity. After I was president — so if you're chair of NomCom, right? — so one thing I'm really proud of, I introduced real guidance when we were looking at candidates, and less of a personality contest; more of what they bring to the table and what region they're from. So the slate for the board that came out as a result of our nominations committee was the first one that every region was represented, so we were successful. We couldn't elect people, and so we had all the regions within IEEE represented on our board, which is key. If we're gonna be a real international organization they can't all be from the U.S. and the U.K.

Yost: And as you ran for president, what were some of the key focal points?

Land: I focused on the practitioner. You know, [the CS had been] overlooking practitioners for too long, and we really need to figure out what products and tools, and just-in-time aids that we need, that they need, that we can supply.

Yost: Were you involved with IT Pro?

Land: Yes I was. Yes. [Laughs.] I remember either reviewing or; but I don't remember in what capacity.

Yost: What were the greatest challenges you faced in your year as president?

Land: IEEE. So we started to turn our relationship; you know, one of my goals was to help repair that. Kasturi made progress, and then my goal was to make more. But it was a very different time; they had no; because of the hostility, they had very little empathy, sympathy, understanding for what the Computer Society did and the value that the Computer Society brought to IEEE, even though it was at the time — I think it still is — the biggest technical activity. We were the biggest standards producer, we had the most members, you know, but really were kind of the red-headed stepchild. I think that was one of my biggest challenges, was talking to FinCom members at IEEE and TAB, and going here is why our finances; and I still am doing that, right? I'm on the Board of Directors; I'm on FinCom, and my goal now is to try to get other people in the Computer Society placed. You know if you're sitting across the table from somebody, talking to them every day, you start to understand their perspective. So we've got to get volunteers with the IEEE so that they understand the Computer Society's needs and our members' needs.

Yost: Both publications and conferences are key to the revenue model of the Computer Society.

Land: Right.

Yost: Can you talk about both of those and strategies that you employed?

Land: The year before I was elected president, I was the vice president for conference activities for Computer Society. We did two things; there was a definite disconnect. Survey data; look at the data, it'll tell you everything you need to know. So we didn't have, you know, we were moving to an automated conferences management system but at the time, everything was done on these forms called TMRFs. Everything was paper and it was all passed around virtually, you know, electronically, but still on a form. So there was really no way if you were the VP for Conferences to really know which conferences were profitable, which ones were not. The data would be presented on the spreadsheet but you didn't know why; you know, what was going on. So I did an analysis. I got all the TMRFs for like the past couple of years, and then the current ones, and I set some thresholds. Now, at the time, the way that the conferences were run was that there was a budget, an allocated pool of money for social, and then there was an allocated pool of money for technical activities. So let's say you had a $100,000 budget. You could put $60,000 in your social budget and $40,000 in your technical. Now, to me, we're a technical organization; that's not appropriate. So those were the types of thresholds and flags that I set. So I did all the; you know, compiled all the data and some of the things that I found were kind of astounding. You know, conferences that had no growth. International conferences for blahdiblahdah, had 30 members for 10 years. Same people. And a social budget that exceeded their technical, that kind of thing. So what we tried to do was make the technical activities responsible for the conference portfolio and management, so we merged the technical activities and the conference activities, because they were separate, and also created some structure underneath so that the technical activities would be responsible for their portfolios. And we started reporting portfolio

health and the goal there was to try to make; okay, you've got these 10 conferences that are not healthy, what can you do to maybe bundle them together or to improve; because it's not just financial health, it's, you know, you've got a conference — and I'll challenge anybody — if you've got a conference and it's got only 50 people, and the same people are presenting the same papers year after year, and the acceptance — I also looked at the acceptance rate — and theirs was like miniscule; you're pissing off a lot of people. You're excluding a lot of people who could be contributing knowledge to the IEEE. That's one thing I was looking for, as well. So it was kind of like everybody's worst nightmare on that job. We changed the revenue model, where I combined the technical; it was one expense pool. And then we went away from; it used to be you would generate a surplus, to straight admin fee, because the admin fees used to come off of only the technical budget, which was crazy because we weren't recouping our money for the help. So I did all that, and then ran for president; and I thought I was going to lose. [Laughs.] But I thought I communicated effectively. There was no way for me to even know; like, I had to manually get the financial chair, and the conferences chair, and then like the general chair, their e-mail addresses off this TMRF, and create my own mailing list because we didn't have one; and say okay, here's what's going on. We're losing this much money every month, this is what's going on with your portfolio. Sort of got kind of a communications campaign; got some of those leaders on board. I think that was pretty successful, but it was a lot of work.

Yost: Was partnering with ACM on some activities a priority and if so, in what areas?

Land: We tried. Yes, in some areas we were very successful and some we were not. And that's really ACM-dependent, in my opinion. I think they're still more personality-based.

Yost: So certainly with curriculum and educational accreditation for computer science there was effective partnership (CSAB)?

Land: Oh yes. Very successful but there were some others not so successful; and some conferences; and key activities we were trying to kick off.

Yost: Can you talk about your work and interaction with the staff leadership of the society, how it evolved in your years as incoming president, president, and past-president?

Land: Yes. I always tell everybody — and you see this — you see volunteers. I mean, power is poisonous. You can be in missile defense, or you can be in a company, or a volunteer organization, and you give some people a little bit of power and authority or recognition and they lose their minds. They forget who they are; they forget where they came from, right? They forget to be nice, they become bellicose. I don't know, I'm not always very good at this. I wear this that says *Amor Vincit Omnia*; love conquers all. And the reason I wear it is not because I'm a sweet person, because I'm really not. You know, I have a reputation, I guess, as being really tough. I think I'm fair, but I do have to remember to be nice, I really do, because my tolerance for BS is about, you know, a third of a cup, right? You just never know who's gonna say something to somebody else, and

who really has the power, right? I'll give you an example. Nomination committee — I'm sort of giving you my rationale and what I try to tell other volunteers, and some listen and some don't, because I've mentored people and it's very frustrating when they don't listen to you; like I get calls from staff, so-and-so's picking on me; now I call that person, why are you picking on them? It's not nice; you're killing yourself; you're killing your future here, you know — but like I said, I was nominations chair. You don't know everybody. Somebody might get nominated and staff, who's the permanent entity in the room, will say oh, they're great or they're not so great. There's no secret; your behavior's transparent and how you treat other people is a big indication of how you're going to lead so you should always treat others well and be fair. I tried to be really nice to staff and I tried to treat them well; there's not a difference in my mind; they have an equal vote. I've been in committee meetings where they won't even let the staff speak. That's ridiculous. You know you should let; they're the guys; they're the fly on the wall, what do they think, you know? They're the ones that are walking the halls at IEEE, what do you think? What's your opinion? So there's a lot of; I don't know, I've been really lucky because I think I've had a really good relationship with a lot of staff.

Yost: In the more distant past, the presidency was two years. How well do you think the model works for one year, along with incoming/past?

Land: I think it's great because you get a wider diversity of people. I could not have done it for two years. I basically had to change jobs, move to MITRE, so I could do that job; and then after I did it, now I'm government. But I don't think companies are going to

be really supportive. It was hard enough for me; like I had to go here's my agenda for the year, it's going to be 300-some hours away from work that I expect you to still pay me because I'm not gonna take leave, right? And these are the benefits. I mean, my whole time at IEEE I filled out benefit brief after benefit brief [on] why the company should care, why it matters; why it matters to industry, to that world. But the; I think; I don't know, I lost my train of thought on that one. Tell me what we were talking about.

Yost: The one year presidency, and justification to your employer of benefits to those serving in the presidency.

Land: Oh. I don't think you could; you can find people that will serve [if it were two years]. I don't think you're going to get the quality. Quality is not the right word but the diversity. Also, the Computer Society is kind of protected because if you get a really bad president — and we've had some, we've had some really bad ones — then a year minimizes the damage and you've got presidents on either side of them, right? So it's really not one president, it's three; and ideally, you have this transition unless there's this personality disagreement where they just can't get along, which we've had before. But still, the damage is minimized. I think that's the best benefit for having it be a year.

Yost: Were you the first president out of a FFRDC?

Land: I think so.

Yost: I know the early predecessor committee to the the CS the IRE committee, a precursor, Willis Ware, of course was the leader, but don't remember seeing any FFRDC people as president since the official founding of the Computer Society.

Land: Yes. I think that now the IEEE board, there's; I'm the only sitting member that's DoD so I've definitely got a unique perspective.

Yost: When you consider all the talented computer scientists working in FFRDCs, in the DoD, DOE, national labs, etc., seems very important to tap for membership and leadership.

Land: I know, and that goes back to what I'm talking about. We are missing a huge; and what's crazy is that we could leverage; the DoD and industry have huge mechanisms for education. Like I'm required to do 80 hours of training a year. Required. If I don't do it, I get dinged on my performance appraisal. They don't do that in a lot of other industries and companies so I just think they're missing a huge opportunity.

Yost: Can you talk about any role you have had in mentoring people for future leadership roles in the Computer Society?

Land: Yes. There's a; right now, there's a; I sent an e-mail yesterday. There's somebody in Huntsville who wants to support the Computer Society but really they have more of a financial background so I directed them to Gary Blank, he's the IEEE-U.S.A. president.

You can't just; you know you get these call for elections and people go nominate me. Well, who are you? You don't have any knowledge of what we're doing and the structure, and the activities, and we're not sure you'd even work, right? What's your work or are you just going to come in and be a lunch eater? So I tell people if you're interested, I'd recruit. You're really sharp, you should really; you know, do you really want to pay back? And if they're interested, I'd challenge them. An example is there's a sitting board member, Jill Gostin, who works for GTRI. I know her; she supports the work that we do here; but she's not a direct report or I don't deal with her every day; but she's brilliant. I said, Jill, are you interested? She said, I'm interested in doing some stuff. Well, she's in Atlanta and I said well, that Atlanta chapter is pretty terrible. Are you interested; can you take on the challenge of maybe revitalizing that? So she did, which is a huge job. I always tell everybody; if you want to run somebody out of the organization have them be a conferences chair, or standards working group chair, or a local chapter chair. Those are the hardest working jobs that we have, and we're making it harder and harder. We're just layering on bureaucracy for conferences; we're layering on bureaucracy for chapters with very little reward. No incentives. I don't know why people do it, but anyway, she did that and I was able to get her nominated. I submitted her name to the nominations committee with a big this is why it's important, we're underrepresented in the membership area. We don't have people who really understand what it means to be working at the chapter level; and we don't. There's OUs and IEEE membership, right? Membership MGA, or whatever it's called now; Regional Activities. And then we have technical activities, so those people tend to go off on this other path so

we lose that. Even though we have chapters, we lose that understanding of what's really going on.

Yost: Can you talk about initiatives in your time in leadership for greater international participation?

Land: One thing I tried to do is reach out to different; create new sister societies and revitalize the sister societies that we have. You know, like the Computer Society of Ireland. We paid a visit to England, to talk to the British Computer Society about some of their products, and you know, we could partner. The diversity on the board is the big thing. If you get people from all over the world; reaching out to India, Japan, we've really grown a lot there; and trying to think of the other areas. China, but China's sort of a tough nut because they have different kind of technical goals, or different goals than we do. They're not as; I've been across the table from Chinese representatives and they're; they told me in IEEE meetings [that] their goal is to take over the world. So that's a little off-putting when you're trying to share technology, right?

Yost: There have been transitions to a more digital model for publications. Can you talk about that strategy?

Land: Yes. I think it's fine if we can print out; like me, if I can print out whatever I receive, I'm fine with it. The problem I have is often you'll get these digital subscriptions and they won't allow you to print them. My biggest concern, if you look around this

whole floor, there's *Computer* magazine everywhere and I've tapped articles that are relevant to what we do here. People come up to me and talk about, oh, I saw that article you put out, that was really cool. Great PR. I worry that people might not be as proactive about laying their magazine out if they have to print it, but we'll see what happens. I know we're being driven there because of the cost, I understand that.

Yost: In 2009 you co-authored a highly interesting and useful article on the history of the Computer Society. Can you talk about that came about and the context for it?

Land: Willis [King] asked me if I would co-author it with him. We wrote it and he's wonderful. I mean, that's how a lot of these things happen. I've just been really fortunate, you know. John Walz; I wrote the first book; I told you they got rid of the guides. What I did; what they did, is they set up a best practices series. You know, I was like all good, I'll write guidance based on the standards I've been teaching my engineers all these years. But John Walz is great. My co-author on three books. I mean, just to find people who you mesh with, then it all comes together; it's easy. I don't know, it was just an easy thing to do.

Yost: We haven't talked much about your work during the MITRE years and MDA, can you talk about your work with both of these organizations, obviously what you're at liberty to discuss in a public interview.

Land: Right. Well, I can tell you what I do. So at MITRE; I've actually been at MDA for about eight or nine years, because I worked part of the time at MITRE for MDA on a program called Concurrent Test Training and Operation. So the idea is; what they have right now. Let me describe what missile defense is, like light, for dummies. We have radar, you have sensors and shooters, okay? So you have the radar that senses the missile, and then you have shooters. And what my program, Command Control Battle Control Communications, we control; we tell the shooter what the sensor sees and we say whether they have; can fire or not fire, that kind of thing. So it's the command and control. There's a really good book called *Command and Control: The Damascus Incident*, that was published a couple years ago. I recommend that anybody read it and you'll be amazed that we never had any kind of major nuclear incident, right? Because the command and control systems were so primitive, and you think about it, what we're doing, and the work that goes into the algorithms. It's shooting a bullet with a bullet. That's how. And I personally strongly believe in missile defense. People can say all they like but I sleep better at night knowing that I'm working on this and I'm defending the country. So I can hit a missile; we might have an EMP event, right? But we're not gonna die; likely, it won't be as devastating; locally, EMP event. So that's basically the easy way to describe what I do. I'm chief engineer for that system, the Next Spiral. So it's the Next Spiral of CTBMC. There's a version that's fielded and then we've re-architected it. The one that's fielded is kind of a kludge, and then we've re-architected it and made it smarter, better, faster. It's going to be field in 2017. But CTTO [Commercial Technology Transition Office (Office of Naval Research)] is concurrent to training and operations, that's where I started, and the idea is right now if you fielded a system, if you wanted;

there's three modes: operation, test, and then training. And so you have one system, well you can't take that system out of operation so you have to stand up another system. Very expensive. Millions and millions of dollars just for the C2 part of it. So you stand up a separate one and they're doing the test, right? So they roll out the new version, they do a missile test, it all works and then they turn it operational. But you've got multiple systems up, and then if you want to do training, it's another system. So concurrent test training; I spent 2-1/2 years doing air quotes; fighting with safety, getting them to understand that there are things that are beyond physical control. The computer safety mechanisms, software safety mechanisms — they had this thing with missile defense because of various accidents and everything — three levels of safety, physical safety. So we had to get the requirements through for this Spiral that I'm the chief engineer on. Before we could even start the system we had to get the requirements approved and the fundamental concept of the design, which is basically through messaging and different other controls that you can have one side of the system up on Ops, and the same system, the other side, up on training. Test, right? So that's what I've done; missile defense.

Yost: On these highly complex systems integration, software engineering projects, is there a mechanism for learning and sharing knowledge and insights on computing/software best practices throughout the DoD?

Land: Yes, there is. We have a whole Defense Acquisition University, all this stuff. So the big difference between what I did at MITRE; at MITRE I was still kind of a worker bee on the project, you know, like trying to make the program the product. So basically,

my role is acquisition oversight, if you want to boil it down. Doesn't sound real glamorous but we were talking earlier, and I said it's almost a billion-dollar program over the lifecycle of the effort for this software and system. But my job is to be the watchdog for the taxpayer. So when this came, this contractor that we've hired, who has hundreds of people if not thousands, I'm responsible for going okay, how do I know that you're on schedule? How do I know that you've developed the requirements effectively? How do I know that you've verified and validated them, because we have the same contractor doing all of it. How do I know that we're getting ready to field? How do I know this is the best, cost effective design? So my job, through acquisition practices, and again, I'm like their worst nightmare; is okay, so I'm gonna put your — one thing I did and I was able to convince leadership here — is I put their internal practices on contract as a deliverable. So why would I put their software management plan on as a deliverable? So that I have to accept that, they're incentivized on their contract, so I can say I'm not going to accept it unless you change this. So I can look at it from the ten-thousand-foot view and go this practice right here you need to change; it's not conformant with 12-207, or it could be improved, or I need more visibility, right? So that's kind of what I; I mean; I can go to my boss, and he can go to the Admiral, and he can go to the President and go yeah, you're gonna get the system in 2017.

Yost: I noticed this past year that you both have given a talk, as well as published an article on gender issues and computing, can you talk about this topic a bit?

Land: I know, what's happening there? Yeah, I'm like the reluctant champion for this. I don't know how I got roped into this. So here's a funny story; I go to IEEE and I'm on the board, and I'm looking around trying to figure out how I can meet people and get connected, network, so we can get more people up there from the Computer Society. I ended up; I got appointed as — you know I never say no, which did — I said sure, sure, what's involved? I got appointed as the TAB liaison for Women in Engineering, which is an IEEE level assignment. And honestly, the first meeting was so dysfunctional and so bad, and so like another world; I mean, it was a nightmare for me. Out loud in the meeting I said, how long is my term? And they said three years, and I went I can't do this for three years unless we make some changes. I mean, Robert's Rules was nonexistent. It was just this chicken clucking club, it was terrible. And then also, they had this idea that because they were a committee of the board of directors, they were very important and had all this power and they didn't. They had no control over their budget; they had no control over their elections; anything. So I spent those three years reworking the governance and kind of reworking that structure, as just a member of that board. Somehow I got — I guess they just respect me, I don't know — I got asked to speak. I never say no, so like well, I don't; I'm not a feminist, I'm not a gender issue champion, but I think I do have a unique perspective from where I came [from]. I think everybody's unique; everybody has a story, right? Sit down and talk to somebody, we all have a story. So I just talked about what my story is, because I'm kind of different; not just where I technically came from, but my path, but also being in the South and all of the different issues that come along with that. So, yeah, I'm talking to; they actually paid to fly me there and it's a paid kind of thing; I don't get money for speaking, just reimbursed. The

Raleigh leadership, like the women of Raleigh, Executive Women of Raleigh, something like that; this month; so I've been practicing that. But the message I'm giving them is if you want pay equity, you have to understand what that means. If you want to be a member of the C Suite, or the Executive Suite, then you have to be committed. You cannot; this whole thing about; you know we say make life a priority or work/life thing — I don't know what the whole catch word was — is that you can sort of have it all, you can't have it all. If you're a woman or a man, whatever; again, men whose priorities are their families, so they're not here 12 hours a day. But if they want to be promoted up, you gotta be committed to your job; it has to be a priority. So that's the message I'm givin' 'em. We'll see it sits. [Laughs.]

Yost: We have already covered a lot of this, but what do you see as the most important accomplishments, looking back at your time as CS president?

Land: Oh I don't know; looking forward. Really, honestly, when you give your; they have the Past Presidents Dinner, you know, this roast thing; and they ask you to think about what you've done and what mattered; that was hard because I don't look back. I'm always like okay, here's where we're going. And I do that with everything so I don't know. I would say that other people would have to evaluate. I mean, I know we made a difference. How permanent that difference is going to be is up to the leaders that come after us.

Yost: Unlike some past presidents, you're still very active with the Computer Society and various leadership roles, as well as the IEEE. What do you see as the greatest opportunities and challenges moving forward for the Society?

Land: I think we have really got to sort of infiltrate the mother ship and we have got to get understanding from IEEE. We're making inroads but it's gotta be more than me. And the few people that are there: Roger Fuji, and John Walz, and Jim Moore; and I mean, that's more [than] when I first went there. It was like, ***me***, and it was scary. It was not a kind of a sympathetic crowd. But we just need to do a really good job, and that's what I beat up the Computer Society Board about, and just sent Dejan Milojicic an e-mail; our message to SYNCOM really needs to stronger. We really need to; there's a sentiment within IEEE right now, and technical activities in particular, that there's not; we lack fiscal transparency, that we can't control our own budgets. The infrastructure at IEEE is kind of driving technical activities into the ground. So we've gotta be there, and we've gotta be respected, and be able to communicate that story. I think that's our biggest challenge.

Yost: Are there topics I haven't brought up that you'd like to discuss before you conclude?

Land: I think it's important to do work at the local level, you know, I sponsor Future Cities Competition. I think it's really important for people that are in the Computer Society, like on the board, to be involved with their local chapter because I think we're

missing the boat on the local activities. I'm fortunate that Huntsville has a really active IEEE and Computer Society chapter, but not every area has that, and that's how we grow our next batch of leaders, right? It's personal relationships; that's how I joined. It's a lot of money every year [for membership]; right? The reason I joined was because I had been involved, I was doing standards activities, and I needed to start balloting. So I bit the bullet and joined, and I'm glad I did. But I think that's how you start; you get people, you get them involved, and all of a sudden they're entrenched and they can't escape. So we need to do a better job of that.

Yost: Thank you so much, this has been really helpful.

Land: Yes. Thanks for the opportunity.