An Interview with

MOLLY LOU REKO

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Abstract

Molly Lou Reko grew up in Amarillo, Texas, and graduated from Colorado College in 1958 with a degree in math, then taught mathematics at the Air Force Academy in Colorado Springs. After taking time to raise children, she attended master's classes at the University of Minnesota (her husband Al Reko then worked for Control Data in Minnesota) in the early 1970s and became connected to the local Minnesota educational computing network TIES, or Total Information for Educational Systems. Her husband encouraged her, with the background in mathematics and teaching, to apply to Control Data. She went to work on the PLATO multi-media computer project. She describes several PLATO programming languages, learning activities or modules, and educational products. She developed PLATO content for the Control Data Institutes, describing William Norris and his deep enthusiasm for PLATO, then managed a group of two dozen PLATO programmers. She also relates her experience with Control Data's emphasis on corporate social responsibility, including early hiring of women and minorities, as well as work on CDC microcomputers. She completed a master's degree in computer design and development at University of St. Thomas. In 1989 Control Data's PLATO division was sold to The Roach Organization (TRO), then in 1991 she went to work for Northwest Airlines initially doing corporate education with microcomputers then working on worldwide installation of computing resources for Northwest's Airport of Preference system. She offers assessments of *Datamation* advertisements from the late 1960s.

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Misa: My name is Tom Misa. It's the 30th of November, 2015, and I'm with Molly Reko in her kitchen. We have a set of questions that we're doing for a project funded by the Sloan Foundation. Molly, could you start by giving us a bit of background about childhood interests or things that you were interested in grade school or high school that may have lead you into a technically oriented career?

Reko: Nothing from my grade school pointed in that direction. I'm of the generation where women were allowed to be nurses or teachers and that was pretty much it. And even then, they weren't to do that very long because they were to marry and women didn't work, except during the second World War they worked as factory support, I think, and pilots, whatever, but I didn't expect to have a career. I was from the South, my father was a lawyer, my mother was a teacher until she married. My aunt was a teacher but she never married. So I expected to be a housewife in the South. I was an extremely good student and math was my strong field, and physics. Those were the classes that I made As in. I didn't do so well in English or history, those were my least favorite. I went to Colorado College.

Misa: And may I ask where did you go to high school? You said in the South.

Reko: Amarillo, Texas.

Misa: In Texas, okay.

Reko: I went to Colorado College just because I got a scholarship there. I intended to be a speech therapist — I don't know why. I intended to go to Oklahoma University but I got a scholarship to Colorado College so I went there first. I was going to go there for two years and then move to Oklahoma. I did very well in math at Colorado College, and by the second year, simply had in mind that I would go teach math somewhere and forget the speech therapy. I graduated from Colorado College in three years, so I was teaching then at the age of 20 in Colorado Springs at the Air Force Academy, teaching math.

Misa: At Colorado College were there faculty that were encouraging of you? And did you have a cohort of women that were also similarly inclined and good at mathematics?

Reko: Yes and no. The faculty, Dr. Leech and Dr. Rawls, it was a very small school and they were intentionally grooming mathematicians and they liked young people a lot, I mean, they were just really good. My good friend Lynn, who was my sorority sister, also was interested in math but neither one of us even knew a career existed named computers.

Misa: This is very new for many years.

Reko: But anyway, I was very focused. I felt my marching plans were clear I would work several years as a math teacher, and then I would get married and stop working. And in fact it kind of progressed that way. I married Al Reko, who was in the Air Force in Amarillo. I had a blind date with him when I was there in college, and then he and I

dated more and more. Until finally when he got out of the Air Force and I was a beginning teacher, we talked about whether he should go back to work at the Army agency in Washington, D.C., his major was accounting which is what he had done before, or if he should come to Colorado Springs and try and find a job there. That's in 1958. That's when I graduated, in 1958. We decided we would try and he came to Colorado Springs, and because I was so close to Dr. Rawls, the math teacher that I loved so much, Dr. Rawls would have us out to dinner all the time. Dr. Rawls and Al looked alike and they formed a bond, and Dr. Rawls told Al that he should look for a job in this new field of computing. It was about the same month that *Reader's Digest* published an article that said any truck driver can be a programmer, which was a brand new field. So Al interviewed at Martin Marietta in Denver, and was hired there as an analyst and worked on the Titan missile. His accounting helped him in that he was keeping inventory and the business end of the Titan. Three years later I got pregnant and quit work. My first child was born in October of 1961 and I did not work again until the mid-1970s, or early 1970s. By that time, we had moved here and by the time my baby was in second grade, I was pretty bored and I went back to the University [of Minnesota] to take some classes in math to help me get a job in Minnesota as a math teacher. In that day, there were 10 applicants for every job so I wasn't having any success getting one. So I went back to the U, worked on a master's-plus, and in that time — that would've been probably 1972 — I got interested in a class taught by Teacher of the Year named David, in the teacher education department about using computers in the classroom to help learning disabled; mathematically challenged, not English, not dyslexia, but mathematically challenged,

which is a whole different class of kid, and in those years they had lots of remedial work for reading but nothing for math.

Misa: And this is an educational school.

Reko: Yes. So he was experimenting with a theory that you could entice a kid to be interested in a math problem by saying here's how you write a BASIC print statement, and you want to develop this statement to solve any question about if a ship is going here at this speed, and a car is going there at that speed, at what time will they meet? So his idea was if the child would develop the algorithm in the print statement, print this plus that minus this divided by that [pause]

Misa: Then you get the result.

Reko: Then you get the results and they would not think that they were doing any real work, they would think they were cheating. It was input this, input that, print that, and that was one of his philosophies. He had some other interesting ones about kids could learn math better if they could feel it, like if you took real things and divide them into piles instead of intellectually trying to figure out what division was. So he had a lot of interesting theories and I came back with that information and began to volunteer at my public schools; like I was teaching BASIC at the elementary schools where my children were going. There was a TIES [Total Information for Educational Systems] system so we had access to a mainframe called TIES. That was an educational computing system.

Misa: I was just going to ask you about that because that's very famous and extremely Minnesotan, so far as we can tell.

Reko: Right. And so that was in the public schools and I would teach them input this, and output that, and print that. And they would be all excited and it made me more interested in teaching the learning disabled, not in computers. Then I went to work in my local junior high school and I actually did get a job that was experimental in nature, where I went to the eighth grade teachers and said give me all your kids that are doomed to fail next year, because I want them in a special class. I got a class of 20 kids that were having very little success with math, and used them then to practice and do work in the line of what David had taught at the U. I substitute taught — I still did not get a full time job — but I was pretty much teaching every day, either as a remedial tutor, or as a homebound teacher, and in those years the children were getting pretty obnoxious. It was during the Vietnam [conflict], and after Vietnam, bad behavior of young people. I don't even know if you're too young to remember that era.

Misa: I'm just young enough to have a historical knowledge of it. I was a perfect child [laughs] I can assure you. It was a tumultuous time; 1968 to 1975 was a tumultuous time.

Reko: I was going to the University with my four-year-old to my math classes when they were burning cars in front of Coffman Union, and my kid would watch them burn and say oh, that's interesting, is that normal?

Misa: That's right, yes.

Reko: Anyway, the kids were very difficult in the classroom and there was quite a lot of pot then. I could recognize the smell. I was very young. Not everybody could recognize the smell so I would go to the principal and say somebody's smoking pot in the boy's bathroom, and they were like oh, I don't think so, not in our school. But anyway, the children were bad. The discipline was awkward because at our school at least, the idea that if the child misbehaved in the classroom, it was your problem and your fault.

Misa: As a teacher.

Reko: As a teacher, you know, you needed to control your children. It wasn't the days where you could send them off to the principal's office. So about three years into that and I had had a bellyful of teaching. I was teaching junior high and high school, my children were in junior high. I was being rude to my children who were actually 'perfect children' because I had had such a bad day with children their age, so I decided it was not the career I had chosen, really. I loved math and I thought people should love math, and I didn't understand it when they didn't want to be there. So I was with some other teachers and my husband at a party one time, complaining about schools, when Al said — it's almost a direct quote — why don't you get a real job like a man? [Laughs.] And I said what did you have in mind? And he said Control Data is looking for women; Control Data is looking for old, tired math teachers.

Misa: Really!

Reko: And I said I had one. [Laughs.] And it was a friend of his from Control Data that had been talking with him in the lunchroom and the friend had said I am the only person at Control Data that has any open req's and I cannot find a single applicant. And Al said what are you looking for? And he said old, tired math teachers. And Al said I have one for you. So that was a joke, and I thought well why not? So I put my application in and I was hired to work on the PLATO Project in the early years. Do you even know the PLATO Project?

Misa: I do. We followed PLATO quite attentively at the University of Illinois, and of course when it was commercialized by Control Data; big, high profile project.

Reko: Then in the early years, the first big curriculum they tried to put out with the math one, and that's why he was looking for old, tired math teachers.

Misa: So your background at that point was . . .

Reko: Perfect, yes.

Misa: Perfect, just ideal.

Reko: So I learned TUTOR, that was my first programming language. I had never — I mean Al had been a programmer for years by this time. He had programmed in assembly language, COBOL, and FORTRAN, probably, in the early years.

Misa: You were doing BASIC statements with the students.

Reko: Yes, do you call a print statement a BASIC; I didn't call a print statement a programming statement. I did not consider what I was doing with BASIC programming.

Misa: That's pretty basic BASIC, but if you're using it to do computations then yes, I would consider that's a type of programming.

Reko: Yes right, sort of. [Laughs.]

Misa: Was it print 2+2, or print 2 squared divided by 7, or something?

Reko: Input A, input B, print A+B; yes, I suppose. But when I learned TUTOR I was doing some real programming, and that language is targeted for educational purposes. TUTOR was developed as a language that facilitated questions and answers in this computer environment for the computer instructor. So all the commands in that language were kind of designed for instruction.

Misa: Was this something a little bit more like FORTRAN that had math statements embedded in it? I don't know TUTOR myself.

Reko: I don't think so. There were a lot of instructions that permitted you to put graphics on the screen, so that you could draw pictures or design so you could show somebody something, like you would do on a blackboard when you're drawing. Instructions that would allow you to point an arrow here, or point an arrow there, and say this part of the screen is saying this, and this part of the screen is saying that. Like if you were showing the parts of a car and you were saying this is where you put the oil in, and this is where you put in the antifreeze. The commands in this language permitted you to easily draw that arrow and flash it up on the screen, and write a statement, and then pause and . . .

Misa: The PLATO terminals for the time, especially, were incredibly graphics rich so the standard teletype terminal would be doing none of these graphics at the time. Interesting environment to be working in.

Reko: Yes. And you could even; there was a command in the language that would say, have the student touch an area on the screen and recognize that they have touched the right or the wrong area. And like if they touched the oil filter instead of the antifreeze knob, you'd say no, that's the wrong place.

Misa: So touch screen rather than say, a light pen or some other [pause]

Reko: Right, a touch screen, and then a must touch screen, and then of course, keyboard entry. Well anyway, I worked on the math project of that and then I had some other courses. We taught a lot of management courses at that time. Control Data was very much behind PLATO, and they had this school, whose name I can't remember, that was to train programmers and technicians.

Misa: The Control Data Institutes were set up all over the place.

Reko: CDI, that was it.

Misa: Right. They were set up all over the place here in the Twin Cities, but [also] around the world.

Reko: Yes. We were developing PLATO courses for CDI. I would be on different assignments like I had some really interesting ones like how to do debt collection without being illegal. I mean, you can't take a shotgun with you when you're doing debt collection, knocking on the door, that kind of thing. How to be a good manager and direct other people. How to fix a car. Mr. [William C.] Norris was really interested in the ecology and he had a plant on top of one of the Control Data buildings that was raising tomatoes hydroponically. That was on top of one of the buildings over here by [Interstate] 494 and close to the airport. We developed courses on how you do that, how you farm, how you do [pause]

Misa: It must've been amazing. [Laughs.]

Reko: Some interesting courses. And then how you program in probably Pascal at that time, whatever the language was, maybe it was FORTRAN, who knows. Most of them are dead now, the languages we used then. The variety of courses that we were programming were really broad. I became a manager of the programmers so I stopped programming, really, and just began management.

Misa: May I ask how large a group did this programming activity become?

Reko: The programming department I think probably we would have 25 programmers. We had many adults. By this time people were actually getting some computer training in colleges, so we had probably several programmers working for us that had a degree in computer science, but that was a new field. We also hired young high school boys, and taught them to program in TUTOR, and gave them what we called programmable running material. So some educational designer would design on paper and hand it over to the programmer who would then implement it.

Misa: So some kind of a tutorial with images or questions, and then [pause]

Reko: Then they would put it in. But anyway, I managed the daytime programming department. There was another manager for the nighttime programmers and those were mostly kids. Then I moved off to a different part.

Misa: Just following where we were on the PLATO program, do you have any sense about how many women, say when you were managing the group, there would've been?

Reko: Oh, that's important, very.

Misa: Sure.

Reko: Control Data's atmosphere was to support emerging women and one of the courses I worked on was called Emerging Women Resource. We had to take it as managers, and it was taught by a person, but we also tried to computerize it.

Misa: Put it into the PLATO universe.

Reko: Yes. And men who were not ready for this called it the 'pushy women's workshop.' Occasionally I still call it the pushy women's workshop, tongue in cheek, but it was definitely — well, Control Data had two goals. Norris was really socially responsible, so he had goals to hire minorities and hire women. And as a manager, you didn't exactly have a quota, but you knew that you got gold stars if you hired minorities and women. So you got really excited when a woman would come. And let me tell you, when a minority woman would come you got doubly excited. And it was a growing world, so it was easy; lot of people were applying and it was easy to get women. And I

would say in my department, there was probably at least half women. But we were encouraged in that direction; that was strongly encouraged by Mr. Norris.

Misa: Do you think that came straight from the top?

Reko: Norris? Oh absolutely.

Misa: It was his personal vision that Control Data should be in some fashion. We can see this, by the way, in the documents but it doesn't necessarily mean that it's Norris' call. But you can see very clearly that early on . . .

Reko: It was his call.

Misa: . . . that Control Data has advertisements — I'll show you some in a moment, not from Control Data, but that are much earlier than IBM or Burroughs, two other companies that we've looked closely at — and we thought that it was probably connected to Norris because he had this, like you say, he had this big vision for the company.

Reko: I worked personally with him on many occasions because he was so interested in PLATO. And even though I was at the lowest level of management, I did presentations to him on more than one occasion. And he was very gruff and scary but really respected women. This just as a side story about him; years later in my career I ended up working with his daughter-in-law, Pat Norris, when I was at Northwest Airlines. And she talked a

lot about what it was like to be — he had a large family — to be a daughter-in-law in that large environment where he was gruff and in charge, and people were intimidated by him, except she wasn't and he adored her because she was not. And she was a computer whiz herself, and she totally felt respected and encouraged by him in every way. So I'm sure; also one of the children that we had as nighttime programmers was his son, David Norris.

Misa: Oh, David Norris, okay.

Reko: And David Norris, you were kind of nervous because you had David working for you and he was the son of Bill Norris, and so you would say something like David don't tell your Dad that this happened at work today, or something like that. And David would say, if I open my mouth about work to my Dad, he would say take it up with your manager and not let me speak about it.

Misa: So he was aware that he needed to be cautious with his son being in the workplace.

Reko: Yes. Anyway, I think he's clearly the key. I'm sure he had other executives that were equally behind him or they wouldn't have bonded with him and started that company, if they had not been. But you know, Al, by the way, worked for Control Data all those years and many of the later executives were friends of Al's when they were young and starting. You could see it everywhere that they were strongly supportive of

women, all the executives, so I never felt odd at all in that environment, or like I should've been a man, even though sometimes in the early years I would be the only woman manager in a group of 15 men.

Misa: Fifteen, okay.

Reko: Fifteen, at least. You know, we'd be at meetings in the early years and I'd be the only woman there in the meeting but I did not feel [pause]

Misa: But you felt like you were respected and treated as an equal and all that?

Reko: Yes, all the time.

Misa: Just straight out.

Reko: Yes. So it was an environment thing, for sure, and there were other wonderful thing that Norris did regarding supporting social advancement, which aren't part of your study, but stories about Norris could go on forever.

Misa: It's oftentimes commented — I think this is true but just to get your perspective — that Bill Norris had a real attachment to PLATO.

Reko: Oh yes.

Misa: Can you just help me understand that a bit?

Reko: I think attached almost to a fault. I don't know. Well, he saw it as part of his social agenda. He took PLATO into the prisons so that all these young men that had no high school degree were suddenly able to get their GEDs in prison because of PLATO. And they could be the world's worst criminals and they could be sitting at a PLATO terminal because they were kind of imprisoned almost in isolation, working with it. He also saw PLATO as the savior for the learning disabled, you know? That nobody was really learning disabled, it was a matter of time. So if you were a math student that was struggling with a certain concept and it took you three hours, and it took this other person 15 minutes, that was fine if you were on individualized instruction because you could take 30 minutes and the computer would never say you were wrong. Our feedback was never wrong, when the answer was — feedback was one of the commands of TUTOR — if you would say what's 2+3 and the student would say six, you're feedback was oh, perhaps you multiplied.

Misa: Really?! So it would guess the possible way of getting to the quote/unquote wrong answer.

Reko: Right.

Misa: Oh, that's amazing.

Reko: But rethink that, you know. Anyway, we were strongly encouraged to be like a human in the delivery of the instruction, and you didn't say wrong or stupid.

Misa: A human with infinite patience is quite rare.

Reko: Infinite patience, and that was one of his ways of reaching the learning disabled. And he also imagined you could bring enough teachers into the classroom, like if you had a really underprivileged school somewhere that had one teacher and 30 really poor kids in the ghettos of some city, that if you stuck PLATO in their classrooms, that they would have more one-on-one instruction and the teacher could be less distracted. He surely saw PLATO as a part of his social agenda, and I think that he's right. When you see the world today and how much computer-based education we do. Everything is online now. You can learn anything online, right down to YouTube. You know he was right. But I think that he was very fond of PLATO, to the point that he probably put more money into it than Control Data got out of it. I saw that because of the projects that I managed. I went off from specific instruction to developing systems that would test — like we called it the CMI system, it was a testing system. Out of that testing system and the people that worked on that project, eventually came people that developed the testing systems that give you credentials for Microsoft skills, or you know if you're trying to become a network analyst you can pass a series of tests given to you via computer. The nucleus of that was called the CMI system that Control Data developed, it was a testing system.

Misa: CMI.

Reko: Yes, Control Data Managed Instruction. And in those days the CMI system would test and teach. And part of Norris' idea — and now probably these weren't Norris' ideas but he hired an awful lot of top notch designers that would give him ideas. You could save time by learning, like if you had a person here that had a lot of math background and one that had a little math background, if you pretested them you could say oh, I can start her at grade 11 but I need to start her at grade 5, with pretesting. And he did that with not just math, but every kind of class. We were pretesting and giving assignments based on the scores.

Misa: That's individualizing the instruction, isn't it?

Reko: It was, very. Yes. But anyway, I worked as a manager of that project, the CMI Project, and eventually, it's very expensive to develop that kind of courseware, really labor intensive. And in order to make it less expensive there was an attempt to make it more systematic so that you could mass produce it better. And so that you didn't have to hire a programmer to develop the instruction, you could hire a [pause]

Misa: So you'd be having something like a template that somebody could use?

Reko: Yes, like a template.

Misa: That somebody could put in whatever domain specific or topic specific questions of modules.

Reko: Right. Those templates had names that were — like we had tutorials, we had drone practice, there were a different set of instruction strategies for which they made templates. And the hope was — I don't know if this hope was ever fully achieved — the hope was that a really good English teacher could sit down with this tool and develop a really good English class without having to program. And then they were called authoring tools. We worked on one at Control Data called PCD3 but it never fully materialized on the market. Control Data kind of wanted PCD3 so it could corner the market, and it could hire the educators that would use PCD3, and have leverage, but of course, other companies developed their own. One of the best known was Authorware, and Authorware was developed by Mike Allen, who had worked at Control Data, who had been at one point my manager.

Misa: Oh really.

Reko: Anyway, you had asked if he was super engaged in PLATO, and I would say absolutely.

Misa: Yes, and also very specifically encouraging of Control Data to be hiring minorities and women.

Reko: Yes.

Misa: So this is kind of a package. It's just interesting to see this, you know, playing out in somebody's career.

Reko: Yes. Eventually, many parts of Control Data started to lose money, not just PLATO. But PLATO was sold to another company called the Roach Organization, and any of us who worked on PLATO went to the Roach Organization and that's where I moved.

Misa: You moved there.

Reko: Yes, and I worked there for a number of years. People did struggle; PLATO is still alive and well and owned by somebody in Eden Prairie. I mean there's a PLATO company still that's developing educational materials, and some of my friends are still there, but I was laid off in 1991. Then by this time, Al had also been laid off from Control Data in 1986, and he'd started his own business as a consultant and he had his own company specializing in Tandem computers. I had six months; I mean I was laid off so I had nothing better to do, and I began to attend classes with Al to try to become a Tandem programmer. I did that for six months just while I was doing job applications, and ended up working for Northwest Airlines in 1991. I was hired in June of 1991. So I must've been laid off in 1990. Anyway [pause]

Misa: So when you were working with Northwest, were you doing something that was on the smaller computers?

Reko: Well yes, and I wasn't hired by Northwest for my computing. I was hired at Northwest for my teaching.

Misa: Okay, it comes back.

Reko: Yes, it all comes back. Northwest, as rumor tells it — I wasn't there so I don't know — did not have a very advanced technology support system and their secretaries did not have personal computers. At Control Data, I had worked on one of the early personal computers. It was called the CDC 110, because my system PCD3, the authoring system, was being developed at the same time personal computers were emerging. It was around 1983.

Misa: Right.

Reko: And my manager, Mike Allen, was very enchanted by personal computers and specifically by the Apple. So we were developing the PCD3 to be used with Apple or the CDC 110. Unfortunately — and this is a piece that we may not want printed but this is my own personal opinion — Control Data missed the point when personal computers came out. It was as if they thought the mainframe ruled the world, and it was that personal computers were a flash in the pan.

Misa: That was very common.

Reko: My manager, Mike Allen, was in love with personal computers and knew that wasn't true. So I was going down the personal computer path and had in my house — I never had a CDC 110 but I had some early AD8. Never mind — one of the really early ugly green things. It looked like a little bitty PLATO terminal, probably cost $10,000. Al and I got it. And Apple computer, I also had one of the early Apples, and they were both in that room side-by-side.

Misa: Wow.

Reko: It was a crazy expense in that time. We were both still working but you know theoretically personal computers were a flash in the pan. And Al never made the move, he was still a mainframe programmer. I got pretty interested in them and I got really good at DOS, and I got really good at the early word processors. I think we had Lotus 1-2-3, and we had WordPerfect, and those were things we were using at work to document our application, the PCD3 authoring application that I was managing. So I was using personal computers to do my management, my budgets, and my explanations of why PowerPoint — it wasn't PowerPoint then but I can't even remember what we did overheads in then.

Misa: But your experience answers the question, then, are personal computers useful, with a resounding yes.

Reko: Oh, yes.

Misa: Not everybody got that, they didn't have that same experience. They were wedded somehow to the idea that computing had to be a large computer. I'm not so familiar with the CDC 110, was that ever a product?

Reko: [Laughs.] It was.

Misa: The 160 was a product but I don't know the 110 so well.

Reko: The CDC 110 tried to be Control Data's answer to a personal computer, and the operating system was CPM.

Misa: Okay, sure.

Reko: I can remember being at a lunch at Har Mar Mall, with a couple of my peers and Al, where one of them was trying to get us to invest in this dude in Washington, who was developing personal computers in his garage. And he was talking about Gates, and he was saying that this is the most wonderful thing, this operating system, this DOS is the most wonderful thing to come, we should not be using CPM we should be doing that. We're just doing what our managers told us and nobody has any money to invest in it, but we were using the CDC 100 and it didn't use CPM. And then when I went to work for

Mike Allen, he knew better and he was investing in — he was being forced to use the CDC 110 because that was politically correct, but we were developing for an environment that would run Apple or DOS-based.

Misa: Mike Allen and Paul Allen, is there any connection between those? Paul Allen was essentially Bill Gates' close colleague during those early Microsoft years.

Reko: I don't know that name, Paul Allen, but my guess is not but you'd have to ask Mike that question. Mike still runs an educational business. It's very close. If you drive down 110 to get to like the Mendota Bridge, you pass it. It's right on the left at Lexington. Mike Allen has a big educational thing there.

Misa: Great, that's good to hear.

Reko: He was a very good educational leader at Control Data during the PLATO years, and probably responsible for much of its story. Anyway, Mike knew that personal computers would be — he was in love with Bill Gates and DOS, and he was more in love with the Apple.

Misa: So you would be using a CDC 110 internally [pause]

Reko: For like our budgeting.

Misa: For budgeting, okay, so things that people could use an early personal computer for.

Reko: Yes. I feel like we used Lotus 1-2-3, and I feel like we used WordPerfect but there may have been something before those.

Misa: Did you use VisiCalc or one of those programs?

Reko: Oh my, that name rings a bell, but I think I was after VisiCalc.

Misa: Okay.

Reko: I may have used it. It took me a long time to understand how to use Lotus 1-2-3. I was buffaloed by those applications in the early years. It was when I worked for Mike Allen that we began to get a ton of personal computers. I wish I could remember the model. I know it was DOS-based but I don't know from whom we got it. Anyway, Lotus 1-2-3 I had to be tutored in more than once by a peer manager who could teach me how to use it to do my budgeting. It was just a nightmare. But now I'm really good at it to do my spreadsheets. But when I put my application in to Northwest, although I'd had a ton of management experience, and by this time I'd gotten pretty good with database and SQL, because that's what Al was learning when I was laid off I was taking classes in SQL with the Tandem, and I got very fond of the database applications.

Misa: Your career has just gone into so many different interesting directions.

Reko: And I was using Paradox at — oh, was there even one before Paradox? — oh sure, dBase, at Control Data I used dBase. I was running a testing lab for PLATO so that we could see if it would handle 50 students at a time without downing the system, and I was using dBase to manage the results. So yes, I was using all those apps for practical purposes and I got very fond of dBase. And then sometime while I was at Control Data, I got so interested in this that I went back to St. Thomas and got my master's degree in computer design, and Control Data paid for that.

Misa: Not software engineering, but computer design.

Reko: Well, it was called computer design and development, and it was a master's program. It was early on in the idea of computer design. It was, I would say, Al's idea of design was to do I want to say a flow chart and there's a word for [pause]

Misa: Sometimes they start with block diagrams, the different conceptual pieces that form a computer.

Reko: No, that came later. They were linear instructions. First I want to add this, then I want to subtract that, then I want to multiple it by this, then I want to look this up in the database and get this result, then I want to do this result. It had a linear description. There's a word for it I can't remember. By the time I went back to St. Thomas, they were

beginning to talk about object-oriented programming and different kinds of design. And it was early in the years of oh, we should look beyond this linear — and I'm using the wrong word when I say linear —

Misa: It could be sequential? It's when you write out program statements 10, 20, 30, 40, 50.

Reko: It is! In fact, I just used this word with my granddaughter — who is, by the way, majoring in computer science . . .

Misa: Oh good for her.

Reko: . . . at Rapid City South Dakota School of Mines, she has a double major, math and computer science — and I used this word to her and I said this is an old-fashioned concept and she said I actually like it best. So I guess that they still do that too. But it's pseudo code! [Laughs.] Pseudo code. The object-oriented programming was new at that time, and also artificial intelligence was just coming into being. So when I went to the College of St. Thomas, I got interested in databases also, and robotics, and then object-oriented programming. So anyway, when I got laid off from Control Data I had this master's degree, and I put in my application all over the world — well, all over Minnesota — and got a hit only because of my education. And as I understand it, the girl who hired me [pause]

Misa: This is in 1991, right?

Reko: This was in 1991, yes. She was only interested in the second page of my resume. She didn't even see the first page because it had gotten lost. But the second page, which fortunately had my telephone number on it, had a reference to past experience and had included the teaching, and the database, and the word processing, and the spreadsheets. Northwest was just moving into buying personal computers for all the secretaries.

Misa: In 1991.

Reko: In 1991, they were just making them turn in their pencils and trade them in for learning to write this on [a computer]. Al Checchi had just come in and he was more modern than the previous CEO. So Checchi was moving us into the world of that, and they hired me to teach. So I taught then, in that education department at Northwest for probably about four or five years, and I was teaching spreadsheets. Then, of course, Windows came in, so I was teaching Windows and moved to Excel, Word, Access, and then I got super interested in databases again, and developed a course for database design for people on the street. Because all of our secretaries were developing their Access databases and relational databases are scary. [Laughs.] Yes, you've got to teach it. Secretary, they have no clue what words you're saying and so you have to teach them how to set up their tables in words that they could understand. It was very fun.

Misa: Such a powerful tool, but you have to have some idea about how all those pieces connect.

Reko: When to use a spreadsheet, and when to use a database. And then fortunately for me — and this comes to the end of my history — I took a job outside that education department because about two years after I left, they closed that department and turned all the education over to external. So all of my peers were laid off, but I had moved to a department where we were developing software to use at the airports. We called it Airport of Preference, and it's what we used at Northwest when you went to the ticket counter and got your ticket, or you went to the gate and swiped your boarding pass. It was doing fancy things like it knew that you were getting on the plane, and it knew that you had a piece of luggage that was supposed to be in the hold, and it would match you and the luggage. And if you didn't get on the plane and swipe your boarding pass but you had luggage there, the luggage came off. [Laughs.]

Misa: Luggage came off. They still do that at London Heathrow, at least.

Reko: Right. So I got on that project only because I was teaching by that time a language called PowerBuilder. It was a fourth generation language that we were going to develop this Airport of Preference in, and I was teaching PowerBuilder and I tell it, and of all my AOP peers with a grin that I was on that AOP project for seven years and I wrote only two lines of code and they would never let me write anything else. I taught PowerBuilder but I never programmed in it. But what I then got really good at was diagnosing and

troubleshooting because now, software is developed in layers. There's the operating system, and there's the network, and the DCPs, and whatever all those layers of hardware and software are, and then your stuff is just on the very top.

Misa: Right.

Reko: And your stuff is sending calls, which are sending calls, which are sending calls.

Misa: It's multi-layered, yes.

Reko: And what I could do — I don't know how — because I hardly know what those layers were, but I could spot where it was going awry. So if it was the DCP that was going awry, it would exhibit a symptom that was different than if it was something else that was going awry, and I could call the right person.

Misa: This is for this Airport of Preference?

Reko: I became an installer, so the last years of my career were the most fun of all, and this was actually in 2000 and it kind of ended my fun in 2001 because we could no longer be so free behind the gates, after 9/11.

Misa: Oh, because of the security concerns?

Reko: Because of security, I could no longer. But before 9/11 I was on the green concourse of Detroit, and Japan, Narita, and running around supporting all the personal computers doing their jobs everywhere and that were running our Airport of Preference product, and installing them at the Detroit Airport when it was new, running up and down those three miles. I was 65 and had a . . .

Misa: Huge airport, really long.

Reko: . . . huge airport with no trains, because you know, a brand new airport, getting really good exercise, pushing a cart at 3:00 a.m., installing computers. Actually, there I got to work during the day because the airport wasn't open but at these other airports I worked at 3:00 a.m. so I spent a lot of time at 3:00 a.m. at the Minneapolis airport before 9/11, going back through the gates and being there at odd hours of the day and night. At age 65, no one expects you to be taking panels or something like cables off of computers and so they think you're the cleaning lady.

Misa: Oh, dear. [Laughs.] At 3:00 a.m. you're pulling things apart.

Reko: At 3:00 a.m. you're going down with your little cart and they're feeling kind of sorry for you, and then you whip off the backs of the [podium] and start ripping out the computers, and they were surprised. And it was so much fun because of that aspect of it, and I loved it. When I retired I was still doing that.

Misa: Why was it called Airport of Preference?

Reko: Because the software was supposed to make your ride so much more pleasant that Northwest would become airport of preference.

Misa: Not the Airline of Preference, but somehow Airport of Preference.

Reko: I don't know why it was Airport of Preference. But it was great software and much fun. You know by this time, I could sleep as well at 2:00 in the afternoon as I could at 3:00 a.m. so it didn't matter when I was sleeping and where I was.

Misa: You must've had a crazy travel schedule then, if you're in Japan, and all over.

Reko: I did have an interesting travel schedule. Al went with me on several [trips], like he went to Narita and I think he came and met me. He was working, of course, and he could fly as a spouse so he came and met me like in Seattle often, on my projects. Anyway, it was a very interesting travel schedule and interesting time. But then I retired, so I don't know what I've left out?

Misa: You've had quite a [career].

Reko: I have my own opinion about why there are less women now.

Misa: I would be very appreciative to hear that. It's a puzzle to me, honestly.

Reko: Well, my father was a lawyer, my mother had been a really good teacher but was a housewife. I had a brother that they spent a lot of energy grooming to be a doctor but their assumption was that I would be a housewife. Although they liked it that I made really good grades, and they wouldn't have liked for me to bring home Cs. They wanted me to make really good grades and they wanted me to get a college degree, that was really clear, but they would've dropped dead if I had said I wanted to be a doctor because women didn't do that. Women were nurses but they were not doctors. They would've dropped dead if I had said I wanted to be a lawyer. My good friend in Amarillo became a lawyer and went to my dad's law firm when she got out, to apply, and he said Wendy, Amarillo is not ready for a woman lawyer.

Misa: Wow.

Reko: And that was probably in 1961. I can't, you know, although my Dr. Rawls would've encouraged me to go on to do — he actually was encouraging me to go to teach in college. But it was still teaching, he didn't encourage me to go be an engineer anywhere. He encouraged Al to go and be a programmer, but it didn't occur to him to encourage me. That was partly my fault because I assumed so much that I was not supposed to do that. And I'm not sure, if I had told my parents that I wanted to be a doctor, they probably would've supported me. It never occurred to me that I could. So now, there are many jobs I wish I had done. I'm sure I would have enjoyed the medical

field. I am certain I would've been a good lawyer. I'm pretty happy with what happened, but it was all luck and weird. It was all just oh, whatever the next move is, is just an accident.

Misa: Just following on this puzzling trajectory of women in computing, some people have said because computing in the 1960s and 1970s wasn't an established profession or line of work, as going to law school or medical school would be, some people said it was easier [because] women didn't know that they weren't supposed to be there, in effect. So if they found it interesting, they had math aptitude, that's kind of your story. And there was no established tradition in the 1960s and 1970s.

Reko: I know that for me, to even think that I got there by plan would be wrong. I got there by accident and it never occurred to me that I even should have a job. When I took the job at Control Data, Al was a manager at Control Data [and] he said it takes at least two years for someone to make back the money that it's cost the company to hire and train you, so I will be embarrassed if you quit before two years. We never assumed — it was just like oh well, I'll do this for three weeks or this seems interesting, I can do that, it would be better than this. So it was all an accident, I never thought —

Misa: Didn't see it as a career move, calculated in some fashion.

Reko: No. Now is when I realize that I hampered myself somehow in a career choice, or that I was hampered, but I cannot tell you one specific person that held me back. I just

know that when I was in high school, women teachers could not be married in Amarillo, Texas. They weren't allowed to be married until about two years after I left was the first time. If they were married, if was kept very quiet. When I was pregnant in 1961, I had to hide it or I would not be allowed to teach. I planned that pregnancy so I could get a full year of teaching in and people wouldn't notice I was pregnant until May. That of course changed, probably four years behind me. So I was like right ahead of that change because I could see four years after I left, pregnant women were teaching. But still, it was more like in the air. It's my assumption that I couldn't, that I would have to plan this right but no one ever said to me specifically that women can't teach if they're pregnant. There was no written rule, I just assumed it because that's what everybody did.

Misa: You see it around you without [its] being necessarily formalized.

Reko: Now my friend Lynn actually went into the computer field after college in a calculated way. She graduated math, she was a year behind me. Al was already computing, we saw each other all the time in Colorado, she got interested in it as a career and she went for it, and she did fine in it. She was in computing the whole time. But I just went with the flow because I made an assumption, I guess, of some sort and I don't exactly regret it, although when I see young women now, I don't see that they're not welcomed. At Northwest, at the time I retired in 2004, there were as many women as men and they were all welcomed. What I saw is that women had all the other opportunities, so they had choices I did not have, and I think that's the deal right there, that women don't see the barriers. Oh, I can be a doctor, I can be a lawyer, I can be an actuary, which is

actually what my granddaughter wants to be and I want to know what that is. You know, I could go off and be a paleontologist. It's just [that] nothing limits women now so there are ***less*** women that are going in; they're more balanced across all fields, I feel like. I never thought Northwest held any women back. I don't think they do to this day.

Misa: Did you see any difference in company culture going from Control Data to Northwest? Control Data was a somewhat distinctive company.

Reko: It was, and because I left Control Data and went to the Roach Organization I had that interim period where —

Misa: That's right, yes.

Reko: Even they were somewhat similar. I think they were both socially responsible in their own ways.

Misa: Northwest and Control Data?

Reko: Northwest wasn't running around trying to hire minorities as focus, but that could've been the times. In the Control Data time, we almost had EEO government regulations helping you make the decision to be more balanced in your hiring. But there was no ***lack*** of minorities at Northwest, it was just that you didn't — and I was never a manager at Northwest, so I have no idea what they were told — but I know that

Northwest was very worldly responsible, such that when corporations were told that they couldn't celebrate Christmas, there's a kind of an oh gosh, we can have a Christmas tree but we cannot have a crèche in the front of the Northwest building. Northwest responded by celebrating every culture so we had some celebration every hour. You know we had the Indian Celebration of Lights, and then we had the Hanukkah, and [pause]

Misa: So it was like everybody. [Laughs.]

Reko: Everybody gets to celebrate!

Misa: Kind of festive.

Reko: It was very festive. So we had parties all the time with really good food, because you know we had the food of Hanukkah, and we had the food of Lights, and we had the food of Christmas, and it was just because it was an international airline and had employees who were Japanese, and we just celebrated diversity. So it's a different kind of social responsibility. But the cultures, I'm not clear on which culture I preferred, I thought they were both very nice. I felt very happy with both those companies.

Misa: I'd like to show you a couple of recruiting advertisements from the 1960s, from *Datamation,* and they have different appeals, maybe, to men and women. I have five of these here. This first one is Bellcom.

Reko: 1967. Let's see where I was in 1967. That's when Robert was born. I had never considered going back to work; I was just still having babies. Oh look at the male and the female symbols. How funny is that! Look at that!

Misa: Yes.

Reko: I wonder what the qualifications were to do that because you wouldn't necessarily have had a computer degree, at that point.

Misa: Oh, no, the first computer science programs were just being set up, so it's not quite clear who they're trying to recruit. But you're quite right that it has men and women. Let me show a second one; not all of them are so inclusive.

Reko: I want to say that when Al went to Martin Marietta, when Dr. Rawls sent him off to see if he could be a computer programmer to stay in Colorado with me. The test to see if he was qualified to be a programmer included one where you'd have the pictures of hands and all sorts of rotations, and you were supposed to pick the hand that was the left hand — it was more a pattern recognition — that would be the qualification. They had pattern recognition tests that predicted that you would be an excellent programmer.

Misa: This is from Lockheed, also 1967.

Reko: Lockheed. Lockheed is Martin Marietta.

Misa: Right, Lockheed Martin.

Reko: This is from 1967?

Misa: Yes, I think these are all 1967.

Reko: Well we were already here. Al was at Martin Marietta until probably 1962 or 1962; sometime in there he moved to Control Data.

Misa: So, across the top [pause]

Reko: 'Where can man go?' Weird. Why'd they do that?

Misa: Number three, RCA.

Reko: 'Our kind of man' that would really catch my attention, I guess, now. It would not have caught my attention then. For some reason, this reminds me; this would really irritate me now, this ad. [Laughs.]

Misa: This is the RCA, yes. And what would irritate you?

Reko: 'You're our kind of man.' The word 'man.' It would make me furious. It reminds me that the first time that I ever recognized that I didn't have to be constrained was around, it was after I moved here so it had to around 1972 when a pastor preached a sermon on the feminine side of God. I asked him for a copy of that sermon because I was so taken by the concept that God could have a feminine side. I still could down and get my hands on that sermon today, but then . . .

Misa: It doesn't quite fit in here, does it?

Reko: . . . I would have read that and this is the kind of thing that made me assume this was not a field for me. The implication is that it's a man's field.

Misa: 'Look into RCA, you're our kind of man.' It says very clearly that half the gender is going one direction.

Reko: That is exactly what caused my mindset in those days. And that's [pause]

Misa: Well this is 1967, so there's a bit of diversity here.

Reko: But see, this one didn't; look at this.

Misa: Yes, that doesn't have — in fact it has the male and the female symbols so it's deliberately inclusive.

Reko: Deliberately, yes. Okay, and see this has a woman in the picture. 'We need men and women with experience,' so they were inclusive.

Misa: This one, to my eye, is quite striking because it actually gives the name, 'TRW is Tom Vickers and Linda Howard analyzing a mission to Mars.' So it sounds like that's a company that is sending a different message. I don't know how intentional all this is, but they're different.

Reko: This would've — 'Wanted: Men with a yen for exploring computer sciences.'

Misa: This is Cornell Aeronautic Lab.

Reko: It's interesting, 'Wanted: Men.' If I had seen this ad in that day, it wouldn't have triggered anything in me emotionally, like oh this makes me mad. It would've been another example of why I shouldn't go into this field; why this field is not for me.

Misa: Right. So you can see the thing that's interesting from this idea that the 1960s, particularly, at least for some companies, women are finding that to be a valuable place; that industry as a whole has different companies with different ideas about how —

Reko: How much of that was Control Data? And when you do your research do you find that Control Data was much more ahead of the curve with that women encouragement thing than other companies, or is it the same?

Misa: We looked very carefully actually at the Control Data records. About 1970 is when IBM makes decided moves to be friendly, not only to women, but also to minorities. And CDC's a couple years earlier. I can't quite pin down when, but 1967, 1968, for sure 1969; but a couple years earlier we can see this. I think Bill Norris says this in a speech. In all Control Data's advertisements we will have women, and men, and minorities visible. So it's a question of the [company's] external image.

Reko: Yes.

Misa: So that was something I think Norris himself [did], and then all the way through to advertisements, and outreach, and you can see that in the records. IBM was kind of in the middle. And then Burroughs, ended up getting connected to Unisys and having a big presence here in the Twin Cities, they're a little bit later. So 1967 to 1972, 1973, the industry is making a tilt, but it's not all at once, and Control Data definitely seems to be early.

Reko: Was the first?

Misa: I don't know the first, but earlier than IBM. And IBM got a lot of attention. They were very proud of having very progressive HR policies and once they made the switch to hiring women and putting them into responsible positions, but I think CDC as a couple years earlier. That's what our research says, at least.

Reko: Al?

Al [Reko]: Yes.

Reko: When you were a manager at Control Data in 1968, I know that you had strong encouragement to hire minorities. Did you also have strong encouragement to hire women?

Al: I don't recall that we had strong encouragement, but we certainly didn't have any . . .

Reko: Discouragement.

Al: Discouragement, at all.

Reko: But you did have strong encouragement to hire minorities, right?

Al: Oh, yes.

Reko: You got that message, anyway, right?

Al: Yes.

Reko: There was no — but the fact that if Norris was putting women and minorities in his advertisements, then people were applying equally, probably, or more equally.

Misa: Well this is what you said, Molly, you saw one of these ads and you would just internalize, well that's not a job for me. And with another ad, same year, 1967, you say oh, that's something I might work for. TRW looks like men and women are doing interesting work, analyzing this mission to Mars, and men and women very clearly. Their names are even there. Sometimes it might be the case that one's a manager and one's a secretary, or something like that. But they're equal, aren't they?

Reko: Right.

Misa: They're just equal across the board. So I think companies sent different messages, and do so today. With women in computing, it's just interesting to see the industry and these different companies find their way.

Reko: Well I watch my own granddaughter, who I suspect — the one that says she's going to be an actuary. She clearly excels at math and science — actually, she excels in everything — but she clearly excels in math and science. So she chose South Dakota

School of Mines because they're so strong in engineering fields, and she's a volleyball player and she got a scholarship, so that didn't hurt.

Misa: Volleyball is so important for young women these days, that's great.

Reko: Yes, it is, isn't it? Anyway, those things didn't hurt, but she's just home for her first Thanksgiving. She's a freshman, and she's sitting at our table working on a computer program that's due next week and all of her friends that are texting her on the phone are saying why are you working? Why aren't you playing? And she's responding on the phone I'm having a good time; this is fun. She thinks it's fun to do it. I think she will not be an actuary. I think something's already changing her plan. Something that's more about it's really fun to program. That's when I said do you use flow charts? Well, no. Do you use pseudo code? Oh yes, I like pseudo code.

Misa: She likes that better than the object-oriented programming?

Reko: I think that when you're doing pseudo code, you could probably work in object-oriented because — and I don't even think they use object-oriented as a word anymore? Is it still? I thought they'd gone beyond that.

Misa: I think it's become almost a given that so many program languages are object-oriented or have been ***made*** object-oriented. That's almost a default.

Reko: Yes. In pseudo code you would just say in words, I'm going to call; I'm going to pass this information to this routine. It's still pseudo code, it's still object-oriented programming, it's just not as linear as it used to be, flow chart type paths. They're not taking paths anymore, maybe that's it. It's like we used to flow chart and take paths in our programming, and we sent data in with information and got results back, and it's like that box was blind, you can't see that box, you just know I'm sending this in and getting this out.

Misa: That's right, yes.

Reko: So you could do pseudo code with both of those.

Misa: Well, Molly, this has been so interesting. Are there any other questions that I might've asked, or topics that we should include in today's recording?

Reko: I don't think so. You brought back some memories that I had even forgotten I had.

Misa: Well that's good. A chance to have those shared with the world. Thank you very much.