

An Interview with

DALE LAFRENZ

OH 315

Conducted by Judy E. O'Neill

on

13 April 1995

Minneapolis MN

Charles Babbage Institute
Center for the History of Information Processing
University of Minnesota, Minneapolis
Copyright, Charles Babbage Institute

Dale LaFrenz Interview
13 April 1995

Abstract

After briefly discussing his educational background, he relates his initial exposure with computing in the classroom while teaching at the University of Minnesota high school. He discusses their use of early BASIC through telecommunications to Dartmouth and the spread of computing use to local schools. LaFrenz recounts the formation of TIES, Total Information for Educational Systems, and his move to Honeywell to assist them in developing instructional time-sharing. The bulk of the interview concerns his role in the creation of Minnesota Educational Computing Consortium (MECC), MECC's early provision of instructional and administrative computing to Minnesota school districts, and the evolution into an educational software developer and supplier.

DALE LAFRENZ INTERVIEW

DATE: April 13, 1995

INTERVIEWER: Judy E. O'Neill

LOCATION: Minneapolis, MN

O'NEILL: I like to start off these interviews by just getting sort of a general background of the person being interviewed. If you can tell me a little bit about your undergraduate degree, where you are from, that sort of thing. We know that you went to the University of Minnesota for your Ph.D., but prior to that?

LAFRENZ: Well, I'm basically a Minnesotan. I have lived in Minnesota most of my life. I grew up in a small town in southeastern Minnesota -- St. Charles -- went to the University of Minnesota for a little while, then went into the military, ended up at Mankato State and got a bachelor's degree there in mathematics education. I began teaching, spent two years in Faribault, and then I moved to the University of Minnesota. At that time we had laboratory schools. In fact, at that time, we had a K-12 laboratory school. The high school or the 7-12 was in Peik Hall and the K-6 was across the street in Pattee, for those who have lost that historical perspective. When a person like me who was a very good mathematics student in college wanted to pursue mathematics, and that's 35 years ago, we're talking about a person who didn't know that there was such a thing as mathematics education. I considered myself a mathematician. So I went to the University of Minnesota to be a mathematician, to get a master's degree in mathematics, but found myself in a world I wasn't accustomed to; I was competing with people who really were mathematicians. Being a good mathematics student is not being a mathematician, and I found out what I really am is I'm a mathematics educator. I wandered across the campus to Peik Hall to find the laboratory school where I was immediately put to work teaching in the laboratory school there. That was a neat program because we were then put together with a group of people who were all interested in pursuing advanced degrees in mathematics and education and teaching in the laboratory school while also being instructors in the U of M College of Education. I spent five years in that situation as an instructor at the University of Minnesota teaching both the high school kids and working with college kids in the undergraduate program and supervising student teachers. So, a neat place to be at that time because the lab school was where the action was. Lots of things going on. Science and math were --

Sputnik era -- high priorities for the country and there were NSF fellowships and other opportunities. I did get a four summer NSF fellowship at Marquette during the period of time when I was at the University of Minnesota teaching. During the summers I would go off to Marquette to work on mathematics master's degree. Of course, as instructors at the University we were expected to teach full time and carry a full load in the graduate school also, so we were very busy people. After five years at the lab school I left, but during my stay a U-Hi there that were five others (David C. Johnson; Pam Katzman; John Walther; Tom Kieren; Larry Hatfield) in the mathematics department who were convinced that the computer was going to be an integral part of education. In 1963 we decided that every kid needed to have a computer access. We began looking around for a way to provide access. Some people will remember that at the time Minneapolis -St. Paul was the computer capitol of the world; this is where all the action was as we made most of the computers here. Univac's home-base was here; Control Data's home-base was here; Honeywell was here and in the computer business at the time; IBM was down the road in Rochester; and then 3M, while not making computers, was making all kinds of other related products. The computer capitol of the world was Minneapolis -St. Paul.

O'NEILL: Do you think that this interest in the mathematics department of the laboratory school ... were you one of those five people who had that vision?

LAFRENZ: Yes.

O'NEILL: What was that based on? Was it a familiarity with the computers from the fact that they were local?

LAFRENZ: Oh, definitely.

O'NEILL: Were you using them in the lab school?

LAFRENZ: No, but we were looking for some way to get computers and kids together in 1963. One activity certainly

was an outgrowth of the environment because in working in the Twin Cities area it was impossible to be unfamiliar with what was going on in the world of computing. We had the vision that computing was going to have something to do with education and we wanted to get involved. We looked around and the first thing we ran into was a guy by the name of Doc -- we called him Doc Smith, Robert Smith. He worked at Control Data and he had a system. He was interested in having kids in high schools use computers. His system was simple but cumbersome -- he had a box of punched cards that we used with the kids in the school. The kids put together computer programs by picking cards out of a box and they put their program together with Doc's prepunched cards. They wrote their data on a piece of paper and wrapped the paper around the cards, put a rubber band on the stack, and then we'd mail it out to Doc Smith in Bloomington. He would get the deck processed, get the keypunching done, putting the program together and then he would mail back the results in a week. Of course the kids had forgotten what they had done by the time we got the results back and about 70% of the time there was an error. So then we had to redo it, pick different cards or reorder cards, and then send it back. The process wasn't a very satisfactory. Remember now that at that time the only kinds of computers that there were giant, big, honking computers that filled big rooms, and of course Control Data had a lot of those and that's why we sent the cards out there. About that time we were looking for a way to bring the computer into the classroom and started looking for a way to buy a computer. The Univac 422 was a trainer computer that existed at that time. Companies used it to train employees. Of course, users had to program in machine language and punch in the codes on the front of the box -- there wasn't a typing process. We were about to buy a U 422 for the U-Hi School. We had an arrangement whereby we could get one at a reasonable rate and put it in the classroom when along came a person by the name of Bob Albrecht. Bob was a graduate student and had worked at CDC and was interested in computers and interested in education. There were five of us at that time who were working on this project -- Pam Katzman, David Johnson, Larry Hatfield, Tom Kieran and myself. Bob said, "What you should do is you should look into this thing called time-sharing and BASIC language which has just been announced." Kemeny and Kurtz, two professors at Dartmouth University in New Hampshire, had implemented time sharing. We called Dartmouth and said, "That sounds exactly like what we want to do." Bob had described how you'd have this little typewriter hooked by telephone to a very large computer. We called John Kemeny at Dartmouth who was the head of the project and later to become president of the University. We told him what we wanted and

he said, "We've got this huge GE computer here and this basic time-sharing system and if you can get here you can use it free." By "get there" he meant if we could pay for the telephone connection to get there. That meant we had to face telephone charges. Since they had a GE computer we went to the GE Foundation and we asked for a \$5,000 grant -- \$5,000 being a lot of long distance phone calls in those days -- and, we bought one model 33 teletype and one acoustic coupler. The rest of the money we spent on telephone charges to get back and forth to New Hampshire. We put the teletypewriter in the classroom. That's really where the whole computer in the classroom started. There was nowhere else in the country that was doing what we were implementing. There was one other project that was somewhat similar and that was at Stanford University. The project was headed by a guy named Pat Suppes. The project ultimately became the company which is now known as CCC or Computer Curriculum Corporation. Suppes, Max Jerman, and Dick Atkinson, had -- I think they got federal money to buy -- a time-sharing computer and put it in an elementary school in California. They put 25 model 33 teletypes in the room and hooked those teletypes directly -- not through time-sharing -- but directly into that computer -- an internal time-sharing because it was an on-site computer -- and the 25 kids would come in and do their drill and practice arithmetic and drill and practice reading on this machine.

O'NEILL: That machine was also a GE running the Dartmouth BASIC system?

LAFRENZ: I don't know if it was a GE or not. It probably was. No, they were not running Dartmouth BASIC. What they had was an internal time-sharing system or as we now call such systems LANs (Local Area Networks).

O'NEILL: So they had developed their own system?

LAFRENZ: They did something on their own there. It was not a telecommunication system. The computer was in the building and so were the teletypewriters. This was the forerunner of what we now call an ILS (Integrated Learning System).

O'NEILL: That would have been about 1965?

LAFRENZ: Yes, that was about 1963 or no later than 1965, for sure. That was going on in California and we had this little thing going on in Minnesota. To my knowledge right at that time there weren't any other computer-in-education activities. Soon after the Philadelphia public schools put together a GE computer lab and Sylvia Charp was running that system. She always debates whether she started before we did, but it doesn't make any difference, it was all about the same time. That is what all was happening in the 1960s. Obviously, Minnesota was deeply involved in the use of the computer as a tool in the classroom. Minnesota's application was different from the others' approach. The Suppes and the Sylvia Charp kind of activity became what we now call integrated learning systems. The computer delivers instruction, and at that time it was all drill and practice software. It is a learning system, where there are 25 terminals and 25 kids and one computer and the kids are all getting the same curriculum in arithmetic. What we were doing at Minnesota was not like that at all. We had a thesis that said -- and we still do have the same thesis -- that we believe that if kids in mathematics are given the opportunity to design a program, which is an algorithm, for a computer, in other words teach the computer how to handle a specific mathematical concept, they'll better understand the concept. We called this process problem solving. The U-Hi group put together a series of 7-12 textbooks which were called CAMP. These supplementary textbooks were copyrighted in 1965-66-67. CAMP stood for Computer Assisted Mathematics Programming. What we did is we convinced Scott Foresman that if they published those supplementary textbooks that teachers would buy those textbooks to use with the teletypewriter that they were going to have in their classroom because we were absolutely convinced that by 1970 every classroom in the country would have a teletypewriter hooked to a time-sharing machine. We had the correct vision, but it didn't quite happen on our schedule and 30 years later not every classroom has a computer. We're getting closer to that now, but we're still a long ways away. So we were absolutely convinced that we were probably on the road to being very wealthy through the sales and the royalties of these CAMP books. Needless to say, since there were hardly any schools that had the necessary hardware at that time, although it was growing fast, we did not gain the wealth or fame that we expected. We put together those textbooks -- that was a five year project from 1963 to 1968 -- at the University of Minnesota, and the first two years we had that one teletypewriter hooked to Dartmouth. Dartmouth then took BASIC

and the time-sharing compiler and sold it or made it available to other people with GE computers. Guess who had a GE computer? Well, in Minneapolis, Pillsbury did. In those days seldom, if ever, was the computer capacity ever approached by the users. The computers would do everything that people could think of for them to do and only be 20% utilized. So for Pillsbury, their huge GE computer over there, they just took on the BASIC compiler and the time-sharing system and Pillsbury began selling time.

O'NEILL: So they could put that on in addition to whatever system they were running, presumably batch operations?

LAFRENZ: Absolutely. Yes, there was a batch operation behind it. So this time-sharing then was available commercially and we used to call it the Pillsbury system so we quit going to Dartmouth after our year and our \$5,000 was gone. We then began to buy time from Pillsbury -- at that time we were able to find the money to do that -- and it wasn't terribly expensive. They used to charge by the CPU second and of course all of the things that we did were a tiny, tiny fraction of a second. So the major cost, since it was now a local call, was simply having a teletypewriter, an acoustic coupler, and a monthly charge for a telephone line. As this happened then the five of us began evangelizing the use of the computer in the classroom and what we were doing and time-sharing. We began going to the Minnesota Council of Teachers of Mathematics meetings to "sell" our idea. Pretty soon there was quite a cadre of people in the Twin City area who had convinced schools to buy teletypes and hook up and start using the computer in the classroom. Basically what we were doing -- what a lot of people started doing -- was teaching kids how to program.

O'NEILL: I wanted to ask about that. In terms of the actual classroom use, how many kids were trying to share that one teletype?

LAFRENZ: Everybody. For example, in our school, U-Hi, the whole school was trying to share it. The operation was very ineffective from that standpoint. The teletypewriter was totally immobile. I mean, it just sat there. You couldn't move it anywhere and it had no graphics, of course. It was a teletypewriter.

O'NEILL: And was all of the programming being done in BASIC then?

LAFRENZ: Yes.

O'NEILL: They didn't attempt to do anything more than that? As the six of you or whoever else might have been involved in terms of the teachers, were you also learning programming at this time?

LAFRENZ: Yes. However, to the credit of the U-Hi team, we saw the programming in BASIC being directly related to problem solving in the mathematics classroom. We researched the thesis that kids who wrote BASIC programs (designed algorithms) to solve mathematics problems actually better learned the skills and concepts under study. Our research showed that this is true.

O'NEILL: So you were just kind of finding your way along at the same time as the kids were to some extent?

LAFRENZ: Exactly. There were the two major things that happened with the Dartmouth program and one is time-sharing -- the whole concept in and of itself, the telecommunications time-sharing -- and the second was BASIC which was so much easier to use than FORTRAN or COBOL or whatever other people were using at the time. Back on the Doc Smith cards, those were in FORTRAN. Remember the Doc Smith and CDC thing? Those were FORTRAN-based and so when we saw this BASIC, we said, "Oh my goodness, that's exactly what we need for kids," and it's an algorithmic language that very closely matches the way we teach mathematics and so it fit together very nicely. Educators around the Twin City area started -- math teachers, it was always mathematics at that time -- getting hooked up. Soon, two or three years after we began this, with our evangelizing, the group grew to the point where there were a significant number of people using computers. We're talking about a few hundred, not thousands, but a very large number compared to none. So the next thing that happened about 1968, there was a group at the University of Minnesota called the ERDC -- the Education and Research Development Council. Their

goal was to provide research and consulting services to Twin Cities area schools. In their research they concluded that one thing someone had better start doing something about is this "computer thing." They concluded that computer use in schools was really growing and the information age is coming. So the ERDC got together with about 20 suburban school districts and the Willmar district and put together a Title III grant from the federal government. The ERDC said, "We want to start a project here and it's going to be called TIES, Total Information for Education Systems." That probably started about 1968. ERDC got a grant and the objective of that grant was to set up an organization that would provide computer services both instructional and administrative to all of the member districts -- the 20 or so suburban districts that owned and operated TIES. I left the University in 1968 and went to help start that project.

O'NEILL: Can we go back to the ERDC? That's part of the University of Minnesota?

LAFRENZ: It was, yes. Part of the College of Education.

O'NEILL: So it was a program within the College of Education which is what you were associated with then as well as the lab school or was this different?

LAFRENZ: We were associated. It was different, yes. It was an outreach service by the College of Education to the local school districts.

O'NEILL: When they started the TIES were you also interested in providing the computer to be time-shared? I mean, you're using the same model. You want to do time-sharing, you want to do programming in BASIC, and you want to have the teletype terminals in the classrooms, right? You're trying to spread this now from your limited sort of experimental group that you've been using and you want to spread this throughout the Twin Cities or through the suburban areas?

LAFRENZ: Yes. That's one thing, to spread the use of computers in classrooms in Minnesota. The other thing was to improve the economics. School districts, St. Louis Park and Edina, were now paying Pillsbury for not one terminal, but they now had one in each of their buildings, so they now had 15 terminals. The schools were finding the cost too expensive. They wondered about providing the service for themselves. Of course the technology began to change. All through our history here the technology is changing very rapidly. One thing that happened is that we no longer needed a giant GE machine. There were now smaller machines put together by Hewlett-Packard and Digital Equipment Corporation. When I went to work with TIES, I was responsible there for setting up the instructional services and another person was responsible for the administrative services. We both reported to an executive director who was a former superintendent of schools. Tom Campbell from Stillwater was the executive director, I was the instructional services director, and Jerry Fahkey was the administrative services director.

O'NEILL: When you say the instructional services, do you mean setting out a curricula in order to teach them how to program or are we getting into having some sort of package on line that they're interacting with?

LAFRENZ: Right. We are. But we were promoting both.

O'NEILL: Can you explain that?

LAFRENZ: On the instructional side first of all, our objective was to supply computer service. Then the second objective was to train people on how to use the time-share computer. The third objective was to provide, as we would now say, software. In those days we called it courseware. That is, packages that would help teachers, not only in mathematics, but now we were starting to find ways to use the computer as a tool to run simulations in social studies. The package would be put together and stored on the machine in the library and it could be accessed for use by teachers and students.

O'NEILL: Who was developing the courseware?

LAFRENZ: We were at TIES and so were the teachers out in the school districts. It was very crude, by today's standards. Nonetheless everybody could put software packages in the TIES library and then teachers could access them. That project had a great deal of influence on the growth of computers in school. We bought a Hewlett-Packard 2000A machine which allowed 16 concurrent users. Of course there were about six times that many terminals -- we called them teletypewriters -- out there competing for time through time-sharing. While that project was going forward there were other things happening. The Minneapolis schools were not part of TIES, but they were very active. The Minneapolis Schools had bought time from Pillsbury so they bought their own HP 2000 machine.

O'NEILL: Was that sort of a parallel development with what you were doing or had that been influenced by what you'd been doing at the University of Minnesota?

LAFRENZ: It had been influenced by what we had done at the University of Minnesota. People like Ross Taylor who is now on the Minneapolis School Board was then the math consultant and he was very active in the computers in the classroom movement. Chuck Lund, St. Paul Public Schools, did the same kind of thing. Getting the various schools involved, and yes, all those projects were going on concurrently, all grew out of the one teletype we had at the University of Minnesota high school.

O'NEILL: With the development and growth of the courseware idea, did you get away from then teaching programming?

LAFRENZ: Yes. The evolution that took place in the United States and the one that we had in Minnesota where it started was paralleled across the United States and is now being paralleled in Europe. That is, we first started out to teach programming. Then we began to see that there is more to this than just teaching programming. Then we started having stored programs in the library, or software, and then there was the whole era of three, four years that we went through where computer literacy was the thing to do. During this time we discovered that, "The computer's

going to have greater influence on society than just a few programmers sitting around. In fact, it may be going to invade every part of our lives." About 20 years ago we were predicting this would happen. We agreed that everybody who comes through a comprehensive K-12 education program should know about the positive and negative impacts of the computer.

O'NEILL: So it goes beyond the math class?

LAFRENZ: Right, called computer literacy. Educators began developing learning materials and teaching for what we called computer literacy. We've come out of that phase now and at this point we're much less concerned about computer literacy. Because the computer has become more commonplace -- it's not ubiquitous yet, but it's getting there -- we assume more literacy when we probably should be more concerned about ensuring computer literacy in all of our populace. There are still a lot of people who aren't very computer literate, but computer literacy as a school subject has also evolved. At one time there was a group of educators who thought to be computer literate one should be able to program in two languages. My position always has always been that being able to program really doesn't have anything to do with being computer literate. I imagined that someday we would have a situation where a "literate user" wouldn't need to program at all. This is where we are now. I always drew the analogy between needing to be able to program a computer to be computer literate is similar to having to know how the internal combustion engine works to drive a car. Computer literacy as a school subject has disappeared. Now, kids gain computer literacy by using a vast array of technology driven by "computer chips."

O'NEILL: Back to TIES. You were there, you went there in the instructional services area in the late 1960s, and were there other competing ideas for how this should be done? Not the TIES idea, but was there a lot of opposition or what sorts of opposition did you deal with?

LAFRENZ: Since we were working in the Twin Cities school environment and delivering service to schools, and remember this area was the computer hub of the world the decision makers on whether computers would be in

schools were very computer-wise. When we went to see a school board about maybe using the computer in their school, guess who would be sitting on the board? One person from Univac, one from CDC, somebody from Honeywell and somebody from 3M. So it most often was not a question of whether we should or not, but which company would be involved. So it tended to be that our little society here called Twin Cities was very heavily pro everything we were doing. Because our public service governance structure was dominated by people in the industry who were computer literate, people who had a vision of what was going to happen, we didn't have a lot of opposition. Now remember, computing-in-schools was not happening in schools across the United States. Minnesota was leading the way toward what was to become a major movement in the use of computers in schools and in the home.

O'NEILL: Were you trying to find out what was happening and not getting any sort of feedback?

LAFRENZ: We were getting feedback and notice. There wasn't an organization to promote what we were doing, but people streamed to Minnesota to find out what was happening.

O'NEILL: So you had visitors coming in and wanting to know what the system was?

LAFRENZ: Absolutely. The computers-in-schools movement grew very rapidly in Minnesota through the 1968 to 1975 period. I personally spent two years at TIES and helped to get that system up and going. Then the commercial ventures started. What first happened is that Honeywell looked around and decided to get into the "computer business." Honeywell got into the computer services business and then decided to start building computers. They built time-sharing machines and decided that education was one industry having computers in its future. I went to work for Honeywell to help them set up time-sharing-for-schools across the country.

TAPE 1/SIDE 2

LAFRENZ: So Honeywell offered me a job to go work with them and set up instructional time-sharing. Educators around the country were beginning to look at getting one of these things (teletypewriters) and do what they're doing in Minnesota. Schools across the country started hooking up to commercial time-sharing ventures which were now popping up all over the place. Honeywell decided that computers-in-schools had the potential to warrant setting up a center here in Minnesota, a center in Atlanta, and one in San Francisco. We called those EDINET -- Education Instructional Network. We established the EDINET group at Honeywell and for two years we ran these three centers. EDINET Centers had Honeywell time-share computers, and the staff went out and sold time to schools. At that time we sold unlimited access to the computer for \$1,000 a month. That would be one port or one time-sharing terminal. So what a school had to do -- that would be in 1970 -- is they had to buy a teletypewriter for about \$1,000; they had to buy a modem -- we didn't call them modems -- acoustic coupler which was \$1,000 at that time. So that's \$2,000! They had to have a telephone line, \$20 a month or whatever it was at that time, and they had to pay long distance phone call charges if they weren't in the local dial up area. Most places didn't have as wide a range of calling as the Twin Cities. Most schools had to pay some kind of line charges, and then they got to the computer. If they got on the computer they could use it as much as they wanted for \$1,000 per month. So we're talking about a pretty sizeable investment for a school to use a computer. That's what we were selling and we sold that to a lot of schools.

O'NEILL: So you were on the sales team then, working for Honeywell, and going across the country to various school districts and selling this kind of a system?

LAFRENZ: That's right. Yes.

O'NEILL: Can you give me some of the other names at Honeywell in terms of who was getting this started?

LAFRENZ: Yes. At the time the senior person that I worked for was Bob Rowland and the guy who actually set up the operation and was my boss was Bob Trocchi. Both are now retired from Honeywell. Bob Trocchi actually went to work for DEC after and is now retired from DEC. I reported to Bob Trocchi and there were four or five other people

who worked with me in the group. One was Tony Vierling, and another person who happened to be his wife, Jackie Vierling, and Jack Vitale, who is still at Honeywell. Ray Culver was another member of the EDINET corporate headquarters group.

O'NEILL: So there were about five people doing the sales?

LAFRENZ: The five of us were the core group here in Minnesota and then of course we had operations people who ran the center in San Francisco, and ran the center in Atlanta. We ran the EDINET Center here, and of course we had the Honeywell sales people who worked for the Information Services Organization -- the ISO organization that Honeywell had set up, and their job was to go out and sell. Our job, or my job specifically, was in management. I wasn't actually a salesman. I certainly went out and made sales calls. I was called a senior consultant. So when the salespeople oversold us and got in trouble, I went out and tried to bail us out. That was a great group of people.

O'NEILL: Was Honeywell doing any courseware development at this time?

LAFRENZ: Yes we were.

O'NEILL: Did you have a direct role in doing that?

LAFRENZ: Yes I did, but, again, it was very crude courseware by today's standard. We didn't do any of the sophisticated things we have now. I was not involved technically because I wasn't technically competent to do that. I was not interested in being a programmer. I learned just enough programming to be able to teach kids. We had EDINET centers for two years and then Honeywell, interestingly enough, in the second year bought GE -- not GE total, GE computing. Honeywell subsequently decided to get out of the computer business. After two years in Minneapolis Honeywell decided to move the information services organization to Massachusetts where their hardware manufacturing was located. I chose not to go with them because I wanted to live in Minnesota. By the

way, one of the things that the Honeywell EDINET center did here was to greatly expand the use of computers in Minnesota schools, particularly outstate. So we used telecommunications long lines to Mankato. Mankato State University had a project where 25 or 30 schools in south central Minnesota used the EDINET computer. The schools came into Mankato State University by dial up telephone and accessed the long line into the Honeywell EDINET center in Minneapolis. The Mankato project was another expansion that again grew the use of the computer in schools.

O'NEILL: Would this be in direct competition then with TIES?

LAFRENZ: It would be except it was a totally different set of customers. There were 435 school districts in Minnesota and TIES served only 25.

O'NEILL: So TIES had its 25?

LAFRENZ: TIES grew and so did other projects. One very significant event was the Minneapolis Schools computing project. Using the Honeywell EDINET system the Minneapolis schools began using the computer in all of the Minneapolis high schools. I can't recall exactly, but applying some arithmetic it's fairly simple to understand the economics that forced change. I've already said it cost \$1,000 a month for a terminal, that's \$12,000 a year that schools had to pay Honeywell for one computer terminal hook up. The lease price for a HP2000 (Hewlett-Packard 2000) machine, like the one we leased at TIES, was about \$30,000 a month. The 2000A was a 16 port time-sharing system. This means 16 concurrent users with at least 3 potential users for each port. Doing the arithmetic, it didn't take long to figure out that if the school was going to have very many of these little terminals talking to EDINET, the schools might as well lease their own machine. Minneapolis Schools did just that and then they sold time to other schools. The growth of computing took a topsy-turvy kind of look. That's one of the things that drove Honeywell out of business; they didn't keep up with the economical small time-sharing system. Sounds familiar? Already, back twenty years ago, we were into the business of the big computer people not recognizing that the little computers

were where the business was so EDINET didn't have a long life. Honeywell got in and then got out of the computer business. I believe we were on the right track but the vision for the future was lacking.

O'NEILL: Did you leave Honeywell because you disagreed with the direction?

LAFRENZ: No, they moved; it was just geographical. This time was the pivotal point in the whole scene in educational computing, the period of about 1971 and 1972. Minnesota schools were getting many computer terminals but so were other parts of the state's infrastructure -- prisons, highways, all of the State of Minnesota agencies -- were getting heavily involved in buying terminals. Around the country, due to EDINET and some other commercial efforts, schools were buying time-sharing services. In Minnesota, then Governor Levander and his staff looked at the annual budget and concluded that the cost of computing in Minnesota is out of control; there's a proliferation of computing services and computing equipment across this state that we have to get under control and get organized. It was a good observation and what it brought about was an edict from the governor saying that there will be no increase in budgets to support additional computing services for any of the sectors of state government until that sector has a statewide plan. This meant that education had to get its act together. There was a need for a statewide plan that covered all of education. To education's credit the act was pulled together -- the people in charge of the various education systems got together. In Minnesota at the time Commissioner Casmey who was K-12 Minnesota State Department of Education Commissioner, and then Chancellor Mitau of the State University System, and Chancellor Helland of the Community College System, and then President of the University of Minnesota McGrath and sat down and began planning. They did represent the public education system in Minnesota. Private education representation was later included as integral to the plan. The pressure to act came from the governor. A lot of pressure came from universities and from high schools who were anxious to have more computing. The education system leaders hired a consultant, which is often the case in special situations. John Haugo headed a small consulting company and was hired to do the thinking and conceptualizing for this statewide plan. John and I worked together at TIES. Both of us were University of Minnesota Ph.D. graduates at about the same time. John's company, EMC (Education Management Company), got the planning contract. At the time I was self-employed and also doing

consulting work. After I left Honeywell I spent two years during the incubation period for this statewide plan doing some evaluation consulting work with John. John produced the plan and it was called the Minnesota Educational Computing Consortium (MECC). The plan laid out a statewide framework regulating and providing computing services, both administrative and instructional, to all of education in Minnesota. It set up a board of directors for the organization now called MECC. The MECC organization was put together under the joint powers act which in Minnesota allows public agencies to cooperatively form a new organization which is owned and operated by the forming agencies. This new organization is given all the powers that are jointly held by the forming agencies and this is referred to as a joint-powers organization.

If that's not confusing enough, let me start over with the specifics of MECC. Four agencies -- I mentioned: the University of Minnesota, State University System; Community College System; and the Minnesota Department of Education with its 435 related school districts -- went together and formed the new joint powers organization called MECC. MECC had only one thing to do in life and that was to do with computing services for education. MECC was in charge of all educational computing, providing it and controlling it. MECC had all of the powers jointly held by the four agencies. In other words, since all four agencies could employ people, so could MECC. Since they could all buy computers, so could MECC. MECC was governed by a 16 person board of proportionate representation. In fact the way it went together is: six reps from K-12 and six from higher ed, two each from three systems. The other four reps included one from the State Department of Administration and then the governor appointed three. This 16 person board was to oversee all of educational computing. And, although use of the word "control" was avoided, MECC was set up so that the Board had approval of educational computing budgets. Without approval, agencies could not go forward with planned expenditures. The computing budget for the University of Minnesota actually was submitted to the MECC board and it was approved. This budget approval by an outside-of-the-University of Minnesota agency was unprecedented and probably it has never happened since. Such approval did happen once. President McGrath was committed to the MECC concept and he and Bill Shepherd, VP Administration, and two other people, Peter Roll and Peter Patton were the University contingent that worked on the MECC implementation. These people had a vision of the big things that were going to happen in educational computing.

They knew that the University of Minnesota's complete support was essential to MECC's success. The MECC board did get set up. It had two things to do: One was this whole approval process or control of educational computing in Minnesota and the second part was to supply services. There was a lot of discussion and debate about potential conflict. Can a control agency also be a service agency and vice versa? In any case, the organization was sanctioned by the state legislature and a law that was passed to allow this joint powers organization to exist. MECC was not funded by the state legislature because it was not a state agency. MECC was set up to provide service and to sell service at cost to its members. The state legislature funded the member organizations for needed services and the organization bought services from MECC. It's somewhat semantics as to whether the state legislature funded it or not, but technically they did not.

O'NEILL: But that's why you don't consider it a state agency?

LAFRENZ: Yes. It was not a state agency. Further, it did not come under all the state government bureaucracy. MECC did not report to the State. It reported to the board of directors and the board was not state appointed other than three people who were appointed by the governor. Others were appointed by state officials so it may be somewhat semantics, however it is a distinction that's worth making.

O'NEILL: That was 1973?

LAFRENZ: Yes. And of course since I had been involved with John Haugo in a variety of ways, John and I thought we could help the Board put MECC together. We made a proposal to manage the set up of MECC during year one. The proposal was summarily rejected by the board. They didn't like the fact that we were in the business of making a profit. They kind of threw us out. There was a lot of politics involved and John was involved in some of the politics. He had previously worked at the State University System for Mitau and for all kinds of reasons, right or wrong, the Board did not accept our proposal. They decided who could engineer a start up. Our proposal was that John would be the acting director for a year and I would be the assistant director and we'd get this thing going. The Board did

decide to go to Mankato State University and draft Professor Don Henderson, who was in the computer science department. Don was on loan to MECC for a year -- the first executive director of MECC. I was self-employed and as soon as I saw the wind was going that way I went to Henderson, reviewed my expertise, and asked for a job. He hired me as a consultant and assigned me to be the assistant director. That's how I got involved day-one with MECC. The first meeting Don and I had was in downtown St. Paul working out of the trunk of his car. That's where we decided what we would do and how to proceed in putting together the organization. Don involved in MECC only the first year.

O'NEILL: Had you known him previously?

LAFRENZ: No.

O'NEILL: You just talked to him because he was the guy who was going to be director?

LAFRENZ: Yes. He was commuting from Mankato and really only at MECC three days a week. What we did was to go about setting up an organization and getting the state-wide instructional time-sharing system up and running. The plan was to have a giant computer in the Twin City area that serviced the whole state, kindergarten through graduate school.

O'NEILL: So it was a centralized idea?

LAFRENZ: Very centralized. Very top down. And that is what we implemented. We put together bid specs for the first ever multi-purpose time-sharing system of such significant size. MECC got bids from multiple hardware vendors, there's a long saga about that, but I'll try to shorten it up a bit. We wanted a 435 port time-sharing system. At the time, Control Data had such a system operating. They were pioneering the time-sharing business. MECC's bid spec was for a seven million dollar lease purchase. It attracted a lot of attention. It was to be the largest multi-purpose

time-sharing system in existence. Airlines had time-sharing systems set up but they were single purpose. MECC's plan was to open this system to students for multiple uses: programming in BASIC, FORTRAN, ALGOL, COBOL, and students could do batch processing in the background; and, of course, time-sharing 435 ports of concurrent users was to be done with a four second or less average response time.

O'NEILL: This is all in 1973?

LAFRENTZ: Yes. Maybe about 1974. The spec went out in 1975. MECC got bids and made the decision to put in the system in 1975. As expected bids came from Control Data, Univac, and IBM. Those are the three that could make that size of a machine. Control Data was actually doing it, with similar machines already working. In fact, the University of Minnesota already had a CDC machine on site that MECC was going to incorporate into the plan. To make a long story short, the bids came in on a seven million dollar machine and the price differences between Univac and Control Data's bid, all things considered and factored in resulted in a \$55,000 difference in cost to MECC. And there was a pro-CDC sentiment and a strong feeling that Univac really had never done this and wouldn't be able to make their machine do time-sharing.

O'NEILL: So the feeling for CDC had to do with the fact that the U of M already had one?

LAFRENTZ: Yes, that was part of it. The fact, though, was that MECC was under a state bid policy and Univac was \$55,000 lower. MECC got a Univac 1110 which was a huge machine and required big roof air conditioning and we had a landing field-sized room to house the equipment. MECC set up in Lauderdale in the University of Minnesota computing center building. The facts -- this is not necessarily unbiased, but having been the point person on the whole thing the whole time, I probably had more information than anybody -- I think it's factual that the Univac machine couldn't do the job. Univac was so committed to being successful in this showcase site, that they actually placed 20 people on site for one year to make the U1110 work. The computer was huge but it did not have a time-sharing compiler. I don't know much about the technology other than from my lay perspective, but what they were

trying to do was to make a huge batch processing machine so large that it could work so fast it looked like a time-sharing machine. However 435 ports is a lot of work. MECC had about 1,500 terminals in schools all across the state at that time. Those students kept the U1110 very busy! MECC set up a telecommunications network using multiplexer stations located in 15 community colleges. Schools came into the multiplexer hub, the multiplexer put many calls on one line and sent them to the computer center on a dedicated line. MECC ran a huge telecommunications network to get all Minnesota's schools to the computer. Every school in the state had a teletypewriter terminal and they were then coming into this central system. Most of the users were brand new to this, some had been on other systems and they knew how it was supposed to work. The Univac system did not work on an average response time of four seconds. The whole situation was very controversial. MECC went with the Univac system and the Univac system couldn't perform. MECC spent a whole year with 20 Univac people making it work. The system was up and down; just a terrible mess for service. Of course by the end of the year with 20 full-time people doing development work they had developed a time-sharing system. But, they also failed their test. Under the law that we were following, the U1110 had failed. MECC notified Univac that they were out. That left MECC with a problem. We couldn't actualize that rejection until June. AT that point how do you get a replacement system in before September when school starts? You don't. I went to the Univac people and said, "Look, it's a bad deal. You're out. Now your system is starting to work." By the way, all the people across the whole state of Minnesota who hated that system -- hated, hated, hated -- until we got up to about spring when it started working, then they started using it. Then they started liking it! We announced, that, "The U1110 system that you hated and now you are beginning to like, we're throwing that out and we're going to do something different." What we had to do different then was to rebid and to go through the process again. So MECC said to Univac, "Look, you do have the system here and people are using it and it works, but it has to go. So would you rather get thrown out and MECC and UNIVAC both lose, or would you rather to leave the U1110 here for a year and continue to make it perform and get paid the lease rate?" since the rate was a substantial amount, like a million dollars over a year. That was a pretty good deal for them as much as they were disappointed and pursuing legal remedy to their problem.

O'NEILL: They were suing you because you were getting rid of them?

LAFRENZ: Yes. They didn't agree . . .

O'NEILL: . . . that they hadn't met their performance criteria?

LAFRENZ: Yes, right. They claimed to have met the criteria, but that occurred after the test time. All of this was swirling through the legislature. The legislature had gotten heavily involved because of the controversy surrounding this highly visible project. In any case, MECC threw the Univac system out, rebid it, and this time CDC did not lose. They came in with the right system and at the right price and Univac rebid the U1110, of course. This time people were predisposed toward getting rid of the Univac 1110 and getting on with CDC and their dual Cyber 73's. About 1977, the Cyber system came in and that was about the same time CDC announced that they were going to take over the PLATO system. We brought the Cyber 73's in and they worked fine. About 1978, just before I left MECC, we had the system up and running and we had thousands of education users. The world of computing was changing! One, educators around the country were starting to get more and more time-sharing in schools; two, Kent Kehrborg, one of MECC's instructional coordinators, went to California and came back saying "You know, I went out to this conference in California and I saw a little thing about so big, about the size of a small box, that does everything that huge computer out there on the floor does except it does it in color." He was talking about the Apple II microcomputer. My comment was, "Don't tell anybody because we've just got this thing moved in here and we've got to pay for it for the next five years!" What really happened is that the microcomputer now had been announced and computing was headed for a major change. Many new computer companies came into being: Apple; ATARI, TI, Radio Shack; Commodore and others. MECC dispatched two people out to talk to Steve Jobs and Steve Wozniak who were the 21-year-old kids with the new Apple computer. They had already announced their intent to save the world and they were going to help education using the computer. They had no information about what we were doing in Minnesota. They didn't know anybody was using computers in schools. We told them about MECC and said we'd like to buy five Apple II's at a special price. They gave us a special price. We brought the five back to Minnesota to sell to Minnesota schools. Minnesota schools not only bought five, but that year we sold over 500

Apple II computers.

O'NEILL: This is still 1978?

LAFRENZ: Yes, 1978-79. Moving on to 1980, MECC became the largest seller of Apple computers. And so it happened that Apple got its start in the educational computing business through its Minnesota connection. Due to good planning, good timing, and good fortune the growth of microcomputers in Minnesota schools provided an opportunity for microcomputers to pick up the increased use while time-sharing provided the basis for computing power. At the very time that the schools were really getting enough microcomputers serviced that they no longer needed the time-sharing, we had the Cyber 73's paid for, and in those days big computers just went away. The lease/purchase was paid, and the hardware was thrown away. In 1978 I left MECC because the microcomputer had come on strong and I was interested in expanding my experience so I went off to Scott Foresman & Co. in Illinois.

O'NEILL: Let me ask you a couple of questions before we move on to post-1978. Was MECC doing any courseware development at this point?

LAFRENZ: Yes, that's exactly what MECC was doing. Before the time-sharing went away and when the Apple starting coming in, MECC converted the time-sharing software library which had been developed by MECC staff and teachers. The programs were in BASIC so we simply converted it to Apple II BASIC. MECC made courseware for Apple available to the schools across the country that were buying Apple computers.

O'NEILL: So you were using the same applications just transferred over to the Apples?

LAFRENZ: Yes.

O'NEILL: And the applications were . . .

LAFRENZ: . . . drill and practice, simulations (remember Oregon Trail predates MECC), problem solving, and tutorial. Understand that by today's standards our programs were very unsophisticated! Twinkie little games kinds of things; no graphics; of course, the time-sharing computer had limitations. Now with the Apple we had graphics and color, but still stick graphics. This conversion activity is what drove the whole industry. We're right at the pivotal point in the story. What happened -- let's back up one step -- because of the connection with MECC and because Minnesota was the hub of all the computing activity and because MECC started using Apple computers in Minnesota, Apple Computer got a real foothold in the education business. It was lucky for them. As a quasi-state agency MECC was forced to use state procurement laws meaning that MECC had to put out a bid specification and solicit bids from all vendors. After we bought those five Apples and got schools involved we had to put out a specification for a statewide purchase of microcomputers. (We called them microcomputers at that time instead of PCs.) MECC received bids from Commodore, Atari, Radio Shack, Apple, et al.

TAPE 2/SIDE 1

O'NEILL: So then you got a bid from Apple?

LAFRENZ: Yes, we got a bid from Apple. We also got bids from other companies. Some of the companies, particularly Radio Shack, were not enamored with this process and thought it was kind of hokey -- the process being the bid process and the state requirements -- and so they weren't real particular about how they responded. We told Radio Shack, "You know, if you don't respond in the right way we can't accept your bid," and they weren't willing to change. Everything was flying high and they were selling TRS 80's like mad. The Atari people and the Commodore people were late and there were very stringent rules -- if you aren't in by noon on the appointed day, you are. Well the fact is that the sentiment of the evaluation committee representing Minnesota education was toward the TRS80.

O'NEILL: Even though you already had the software converted to the Apple?

LAFRENZ: Just some preliminary conversion had been done and the bid was going on concurrently. All we really had going at that time was we had bought the five Apples and we had to get a statewide purchase plan set up. All the machines considered had BASIC so conversion could work on any one of the machines. The short of the long is that Apple won, a bit through default on Radio Shack's part, but anyway Apple won the bid. MECC starting buying and we sold 500 Apple II's and began converting in earnest. At the same time then the rest of the country awakened to the fact that microcomputers in classrooms would be the thing of the future. Many schools began buying Apple computers. Usually what happened after schools bought computers they said, "Now that we've got it, what are we going to do with it?" They didn't have any software. So the common answer was "Go to MECC" because MECC had software. I wasn't at MECC at the time. I was gone by then. Ken Brumbaugh was the person who took over when I left. He was on the staff and then he took over the instructional services position when I left. Later, he became the executive director of the company. At first MECC gave away disks. Schools came from Pennsylvania, Florida, all over, and asked, "Could we have your software?" MECC soon figured out a system of distribution that would benefit Minnesota. An opportunity to promote the MECC venture was present. MECC came up with the system called the site licensing program. It was not actually called site license, rather a membership program. Schools came to MECC and agreed to pay X dollars for a disk with five programs included. Schools were then allowed to make as many copies as needed for the computers in the district. That's the way the program started and it still runs that way. It's a bit more sophisticated now. Actually, that's how computing in the U.S. schools. MECC supplied the software for thousands of schools to get going. In fact, go across the country anywhere now and ask teachers who have been actively involved over the last 10 or 15 years in educational classroom computing and invariably you'll find somebody who will say, "You know, if it weren't for the MECC membership program we would never have gotten going." So that's how educational software started. Remember at that time there was none of what now exists. There weren't dealers. You didn't buy software on the street. A distribution system was needed and MECC invented a distribution system -- the MECC membership program. As demand grew MECC recognized a need to establish a member in a state and let that member make members of the school districts. MECC went out to Pennsylvania to one of the area education agencies (most states have some kind of a structure) and enlist the membership. This multiple

school district agency got a license from MECC to get MECC's software and to sell a license to a district. MECC developed a network across the whole country and that became a real money-making operation. Every state in the country had MECC membership arrangements. All of a sudden the MECC concept of educational computing service/control to the state of Minnesota began to crumble. Over the years as local control took over from this very centralized approach, the local control fanatics took over and pretty much dismantled the original MECC concept. The instructional time-sharing which worked very well from a centralized approach because of the current technology and rightly became a local issue with microcomputers. MECC logically got into the software business -- nation wide. On the administrative computing side MECC had set up seven regions in the state. Each of these regions was to have a big computer to supply elementary and secondary school districts with computing services. Each of the seven MECC regions was to use common software provided by MECC. The model failed when local educators in regions resented "being told by MECC." The idea of one statewide system, encompassing seven regional computer centers, with all software coming from MECC for the purpose of common software, common database, and common data collection and common information became a victim of local control. Local control people didn't want that and soon we had seven regions, but they were autonomous for MECC. The centralized approach went away. MECC was now an organization whose original function had gone away. And, in fact, MECC had generated a new function, it was a nationwide-selling software business. Since the organization was no longer what it used to be along about 1983 governance of the organization was changed. The board was disbanded and a smaller board of nine people, appointed by the Governor, was authorized. The State of Minnesota took over ownership and instead of being a consortium the new organization became a public company. Not publicly held, but in Minnesota there are few public companies and MECC was one of them. There is a state law that said there shall be a for-profit corporation wholly owned by the State of Minnesota called MECC and it shall do certain things and have certain powers. The law set MECC up as a profit making corporation in the state of Minnesota, owned by the State of Minnesota and governed by a board appointed by the governor. This organization called MECC shall have all of the rights and responsibilities of any corporation in the state of Minnesota and has to live according to the corporate laws of Minnesota and the United States. Also, MECC was taxed. The only power the MECC Board of Directors did not have was the authority to sell the assets without legislative approval. Otherwise, MECC was independent. There was to be no money going

either way and this organization survived on its own. During the five years I was gone from MECC this organizational change took place. Ken Brumbaugh, MECC President, engineered this change. MECC now was a whole new business, making and selling educational software; out of the hardware business and out of the administrative computing business.

O'NEILL: Can we just back up and cover those five years while you were gone in terms of what you were doing? I know you went to Scott Foresman & Company in Illinois.

LAFRENZ: I went to Scott Foresman for one purpose. I wanted to spread the use of computers in the classroom. I had a connection with Scott Foresman -- they published CAMP. Scott Foresman was also one of the major elementary-high school textbook publishers. I called them one day and said, "You guys better get on the ball down there because this whole computing thing is going to sweep the world." This was ten years after the first time I'd told them. I went down and gave them a sales pitch and the outcome of that was an invitation to come down to Chicago and help them get started. So I went. I started a department within a division within the corporation, a one person show. Within a couple of years educational computing had grown into a division in the company. Our objective there was to make software for schools to use with microcomputers. Same as MECC's objective. At Scott Foresman we got involved with the TI994A which was a flop. We ultimately did end up with a division in the company, about 125 people, called the Electronic Publishing Division. I was vice president and general manager. We were profitable after about four or five years. Then we had a change in leadership in the corporation. The chairman of the board of the corporation, for whom I worked when I went down there -- he hired me -- got fired and for all kinds of good reasons, I guess, and they brought in a new corporate chairman, Jack Purcell. He came from CBS. He was an executive VP at CBS and also Gannett Publishing. He really knew nothing about our general business -- educational textbook business -- but he was certainly enamored with the electronic business. Our five year plan was to make a company out of this new venture, and it wasn't yet a company. It was a division in a company within the corporation. Jack wanted to move quickly so we renamed the division. We named it Mindscape, a company of which I was supposed to be president. But as often happens in the corporate world, Jack came from Connecticut and there was a

guy who lived in Connecticut just down the street who was also interested in the President job. So to make a long story short, they hired Roger Bowie to be the president and I was executive vice president. That arrangement was only temporary, and in corporate America the last thing needed is two people in one company -- one who is president and the other who thinks he should have been. So it was only a couple of months of my sticking around waiting for a severance arrangement. I got it and left Mindscape. The company still exists and it's a significant company that competes with MECC.

O'NEILL: What kind of projects did you want to develop for the educational program? Was it the same kinds of products that you had done at MECC?

LAFRENTZ: Yes, but technology and new applications were evolving. We had an excellent opportunity at the time when I was at Scott Foresman. MECC and Scott Foresman were the only developer/distributors in the business. During the period of five years that I was at Scott Foresman the companies you now hear about all were started. I was involved -- that is, talking and sharing ideas -- with all of them. I remember seeing Jan Davidson running around California with her little product called Math Blaster or whatever it was called at that time, and thinking, "Nobody will ever buy that." Wrong! Now Davidson is a huge company in this business and Jan is very successful. I have seen many of the companies I've been involved with become successful. All of those opportunities and I didn't invest in any of them. Shows how smart I am! I saw them start up and I saw this industry just mushroom. At the same time, Scott Foresman was bogged down in being a book company. Educational textbook companies are the most conservative companies around. Ten to fifteen years ago it was very difficult to get any kind of visionary zeal in the company. Obviously the people who hired me thought there was something going to happen, but we just never could get it going. The book companies are still struggling -- fifteen years later -- to get into this business. They desperately need to be in this business and they now know it more and more. When I left Scott Foresman there were many things going on in the industry. I had lots of opportunities to go and work with some of the emerging companies. I didn't take any of these opportunities because I wanted to come back to Minnesota. My family and I decided to come back to Minnesota. Remember, MECC bought a Cyber 73 so I knew some of the Control Data

people. They were big in PLATO and they had invested multi, multi-millions of dollars. I had always said that if I ever got a chance to be part of CDC's education effort I knew that I could help them make a successful position in the market. So I picked up the phone and called Walt Bruening who was president of one of the three companies in Control Data. A person I knew from MECC contacts. He had been a university vice president before he went to CDC. He was involved when we set up MECC. Not a buddy, but I knew him. I told him what I'd been doing and he invited me to come to Minneapolis to interview. So I went and took a job with CDC. I arrived at the time when CDC began to go down hill. I don't think it was cause-effect, but shortly after I got there things started to fall apart. I only stayed there nine months. I worked in the education group, in the PLATO and PLATO/WICAT group. I was director of K-12 marketing for nine months.

O'NEILL: What were the things that you thought you could do differently for PLATO?

LAFRENTZ: There were a number of things. One, I knew that the large time-sharing machines were not the way they should be going. Two, I was very well convinced that they needed to do something besides the intense drill and practice tutorial kinds of activities. There was going to be a lot more to instructional computing than what they included. I would have directed their effort off that narrow definition. The third thing was that they absolutely, in my opinion, only my opinion, refused to deal with the real world in terms of customers. Who were their customers? They didn't see their customers as the teacher in the classroom who was going to make it work. That's fundamentally a different philosophy than MECC is. Many big companies come in to the school market looking to find the decision maker. They have a top down strategy. That's not the way it works in the education sales business. The sell is top down, bottom up, inside out and outside in. You have to convince everybody. Large companies that wine and dine for the superintendents would get them to buy the big PLATO machine and of course the teachers would use it. Wrong. Teachers won't use it. The teachers will, if told, march through the hoops, but that's not going to make the system work. I could have been helpful to them if they had asked.

O'NEILL: What were some of PLATO's strengths? Were there any?

LAFRENZ: Yes. For the time, they had tremendous technology. With a great visionary like Bill Norris at the helm you would have thought they could have seen the small computer writing on the wall. But, great visionaries some times lose . . . they don't lose their vision. They just keep their vision too long. They don't change it. He didn't adapt his vision. He absolutely was convinced, and he may still be convinced, that the big machine has a very significant role in general computing going forward. He can't be convinced anymore. It has a role, but it's not the significant role that we once envisioned. That was one of CDC's problems, but at the time it was also their strength -- they did have the right technology. Back when we were doing the original MECC statewide network they had exactly the technology we needed. Unfortunately for CDC, that time passed. The other strength that CDC had was a lot of high level expertise around the psychology of learning built into their materials. Those materials were put together with good understanding about how kids learn. Unfortunately, their theoretical models were not very pragmatic. The best way kids learn doesn't necessarily match up with the way teachers teach. Now that's unfortunate but it's not the teacher's fault. Teacher's can't teach the best way kids learn because best ways to learn are different for each kid and the teacher has 35 individuals. So the theoretical basis of the PLATO material's very strong, but again, they forgot to ask these people who are going to use it; just ask the theoreticians and develop it. The system just did not work that way.

O'NEILL: Had your experience with developing or being responsible for development or being involved in development of other courseware software, involved this theory as well? You're making it sound like the Plato stuff was very theoretical and so I'm wondering was the other stuff a hybrid of the theory and the practice or was it really much more practical-oriented around the teachers?

LAFRENZ: I think our CAMP and MECC approach was much more practical. To sell instructional software it must have a theoretical base because somebody will challenge its validity. One must be able to answer questions the underlying theory. Keep in mind that the third grade teacher who is making the buying decision decides on the basis of utility after being convinced it is theoretically sound. A company may have the most wonderful materials in the

whole world and if (A) they don't get sold, and (B) they don't get used, what good are they? I think the PLATO courseware was quite sound. Susan Schilling, MECC's senior vice president of development was integral to the development of CDC PLATO courseware for many years. She's been leading MECC's development for 9 years.

O'NEILL: So you came back to MECC in 1984. Had you kept in personal contact with the people over at MECC?

LAFRENZ: Yes.

O'NEILL: So you knew what was going on. It wasn't like stepping back into something that you didn't know what was going on.

LAFRENZ: In 1984 I came back to MECC. I had been at PLATO for nine months and there really wasn't a job there for me. I was kind of passing time and looking for something else to do. PLATO merged with WICAT at that time. WICAT, another integrated learning system like PLATO, was supposed to be a complimentary addition. That was Walt Bruening's mind storm. I took the position of not understanding what the merger was supposed to accomplish. It didn't do anything. In fact, it ultimately fell apart and split. Given that I was against the merger, I didn't see what I was supposed to be doing there anyway and I didn't understand what they were trying to do I decided this probably wasn't going to work. Time to move on. At the time I was unemployed during my severance arrangement, I had done some consulting work for MECC. Education and software vendors were starting to sell things in the home market and I had consumer marketing experience at Scott Foresman and TI. So I knew something about marketing and selling in the home market and the people at MECC asked me to come and put together a home market plan. They went ahead and implemented my plan while I was at CDC. Of course, I was still talking to them. After awhile they said, "Instead of just meeting us at 7 o'clock for breakfast, why don't you come and work for us again?" So working at MECC meant that I reported to Ken Brumbaugh who used to work for me. He was now president. That was fine with me and okay with him. He wanted to get the job done and he thought I could do it. So I did just that. Subsequently Ken left MECC and I became President/CEO. This change was simply because Ken had some

disagreement with the board of directors regarding company direction. He left and then I became president.

O'NEILL: So you really did come back to do marketing? It wasn't like a grooming for the president?

LAFRENZ: No. I came back to be vice president of marketing. I've now been at MECC for the last eleven years -- ten as President. I took over as President/CEO in the second year the company was a public corporation. We were a public corporation for about seven years, and during that time MECC got along just fine. We grew. We made lots of changes, kept up with technology, produced our Apple software, and sold our Apple software. That's how we existed and every year MECC made a little profit. Profit went into developing more products. We had nothing else to do with profits. I mean there were no cash/stock dividends. However, Minnesota schools always got a dividend from MECC and they still get a dividend from MECC. The dividend is in the form of the MECC products at cost. MECC sold all over the country and brought revenue to Minnesota and then turned some of it back to Minnesota schools. And, MECC also greatly propelled the industry in terms of developing software. During that period of time competition became very fierce. Some of the companies that I laughed at and thought would never make it became very significant companies. Particularly, this occurred with the advent of the home market. MECC continued to dominate the school market. MECC went into the home market and we were really behind in the home market. One of the things that we didn't do because we were so dominant and then dominated by the fact that we were the school market supplier. MECC simply stayed on Apple II because Apple II computers were the school market. We didn't have much software to take to the home market because it was MS-DOS dominated. In the home market other companies got way ahead of us. So that's where we were in terms of the home market. About five years into my being President/CEO management decided, "This is not going to work. MECC is going to get eaten alive. Other companies are starting to get into the schools and Apple II is going to die and the computer we need to be on is Macintosh and the PCs (MS-DOS at that time). How do we get there?" A major shift was needed and that would take a lot of investment of capital. MECC decided to go back to its parent, the State, and explain the situation; and get the needed investment capital. That would never happen. The State was not in a position to invest as needed. We came up with the plan to sell MECC to raise the capital needed to implement the essential changes: 1.) new

product development; 2.) expanded distribution. MECC had to change ownership.

TAPE 2/SIDE 2

LAFRENZ: I had the unenviable task of convincing the State of Minnesota to fix something that was not broken. Management convinced the MECC Board of Directors that there was no other course and then we went about convincing the State. Remember, our Board of Directors was not allowed to sell the assets of the company. It had all the rights to do everything but that. So they couldn't allow us to even take on an investor because we had to give the investor equity. I went the Legislature then with the Board's blessing and legislation successfully got passed to change the state law. The state law establishing MECC was amended to allow the MECC board to sell any or all of the assets. The decision was made to sell MECC. The State would no longer be an owner. The state government did ask, "Why are we trying to fix this when it isn't broken?" The state representatives and senators did ask because all they knew about MECC was the positive feedback they got from their schools. When I told them we were making a profit, they were concerned about the schools losing service. They did believe that we needed to change to survive and thrive. The legislature changed the law. We then went through a very comprehensive process to find a buyer for MECC. Since we were of sorts a state entity, we were a potential "political problem." Remember, that the software business was not as it is now. Five years ago there was not this wild enthusiasm for software. The home market hadn't broken open so there was a lot of caution. MECC was not a very attractive buy. That was contrary to what most people thought. Our Board was sure that Apple would swoop down and buy us up in nothing flat. Other people thought IBM, because they were struggling to get in the education market, would want MECC. Of course, the book companies would all be fighting over it, and so forth. I put together a plan that segmented the whole spectrum of possible purchasers. We listed all textbook companies. We listed all hardware companies. We sent about a two-three page letter to each of these companies and many more. We told them what we were going to do; MECC was for sale and we gave the conditions. Each was invited to consider buying. If they wanted a prospectus from MECC, sign a confidentiality agreement and send the letter back. We sent to 50-60 different companies including banks and investors and venture capitalists, and others. The fact is we got about a dozen responses. We

got a letter from IBM and Apple saying, "No thanks. We're not interested." We got one response from a textbook company and they weren't interested. When we sorted through all of the responses we came out with six bona fide bidders. Two of them local companies that, at that time, you would have expected -- Josten's and National Computer Systems, both big in the education computing business, but neither of them in our specific business. We got three bids from venture capital companies and we had one local business person who was bottom fishing -- they wouldn't want to hear me say that, but that's what they were doing and I told them that. By the time we sorted out we came to the conclusion that we did not want to be bought by a big company and folded into their operation. We'd lose MECC's identity. MECC told them and they went a little bit ballistic. Both began their foray off into the governor's office and the legislature trying to force MECC to consider their offer. Some things got all bent out of shape; misquotes happened but MECC's decision prevailed. MECC didn't end up a subset of the larger companies and hindsight now shows it's a good thing. Josten's Learning Systems had trouble and NCS never has committed to being in our business. I think we would have just gotten lost in either of those companies. MECC decided a venture capital group was needed. North American Fund II is the fund that paid over five million dollars for MECC. Twenty percent of MECC stock went to employees -- part of the deal with the State. For three years MECC was a private company, 80% owned by North American Fund II. During those three years MECC simply went about doing what we thought we had to do. MECC developed Macintosh and MS-DOS software as fast as we could. We lost money. The venture capital people invested any profit they might have expected. The fact is we got our plan done with all internally generated money. In March 1994, after three years of showing a loss, but getting ready, MECC went public. MECC had a very successful public offering. MECC sold 26% of the company which diluted the other holders down so that North American Fund had 60%, employees had 14%, and the public owned 26%. MECC raised \$22 million on the offering. The stock went out at \$11.50 per share and we sold two million shares. We used that \$22 million to pay back the venture capital people their \$5 million, plus 9-3/4% interest over three years, which is a million and a half dollars. North American Fund II got all of their money back and still owned 60% of the company. The stock today is worth approximately \$30 after a 3/2 split. It's worth more than four times the offering price. MECC is now a very successful publicly-held company in a dynamic growing business that's got nothing but upside. Our downside right now is survival. Not survival from a financial standpoint, but from consolidation. There are many big

players now. Our competitors are Microsoft, Disney, and Viacom, and all of the big companies eyeing multi media businesses. The fact is that we still have a real solid dominant position in the schools. Over half of our \$30+ million revenue will come from the schools. The other half will come from the home market. The home education niche of consumer software is the smallest but fastest growing segment of consumer software. It grew about 70% last year. MECC grows about 30-35% a year in revenue. We have a good position in the home market. If you look at who dominates the shelf in the retail stores, and we are in every retail store out there -- Target, WalMart, K-Mart, Software, etc., Babbage's -- you'll see that Brøderbund, Davidson, Learning Company, and MECC are the four leading companies. There are 2,000 companies that want our space. There are companies coming into being every day. MECC has a good position and we have that position on the basis of a hit product -- Oregon Trail, which is our flagship product. It's been around for 25 years. It is a product that was converted off the time-sharing system. About one third of our revenue comes from Oregon Trail. That brings you right up to date in terms of the whole saga. The bottom line analysis of what I'm interested in having people know is the total perspective on the history and the importance of Minnesota in the educational computing movement. Minnesota really did drive this whole thing. Not only the school side, but also the home side. The home market grew out of the school use of the computer. I'm interested in having people know about our role. Of course, on the ego side, I'm interested in having people know I was involved. I think it's an interesting story and the evolution of MECC is interesting. Most everything I run into is interesting! Is it useful? I think MECC's story is useful and I get a lot of requests for information about the privatization of MECC. Organizations in the public sector that are trying to become private want to know, "How did you do that?" A lot of what happened may be circumstantial. However, none of it would have happened if we hadn't taken the initiative and made it happen. So that's the end of my story.

O'NEILL: Well, it is very interesting and worthwhile. I wanted to ask you about the Minnesota connection again. Obviously there were advantages to being in Minnesota in the special situation you've described throughout the interview. Right now, are there disadvantages to being in Minnesota?

LAFRENZ: Yes. Interestingly most of those things are two-edged. One is personnel. The talent that we need is not

readily available here.

O'NEILL: Do you look for teaching or for programming or both?

LAFRENZ: The whole thing has evolved and changed so much now that we're more in the movie business than we are in the computer business. If you go down on the second floor you'll see video studios, audio studios, voice-over people coming in, professional actors and auditioning taking place. We're in pretty good shape in Minnesota for acting talent. On the technical side, we hire C++ programmers now, but it's becoming hard to tell the difference between a programmer and an animator illustrator. It used to be we had one artist here and she did all of our character graphics. Now we have 14 animator illustrators, and we have many programmers. If you define a programmer to be a person who lays down code, then you would have to agree that if you lay down code you're a programmer. If you talk to an animator illustrator and ask what they are doing they could reply, "I'm coding." Well, is this person a programmer? No. But are they laying down code? Yes. How are they able to do that? Because the tools they now have to work with automatically generate code that goes right onto the CD-ROM. Yet, what they are doing is animating and illustrating on screens and on sketchpads. Where is the hard line of distinction? It isn't there any more. Then you say, "Well, if a person is involved in art then, they are an artist," and you talk to a programmer and you ask what they are doing they could reply, "Well, I'm doing this art. I'm finishing up this artwork." "Why are you doing this and why isn't the animator doing this?" "She doesn't understand how to do what I'm doing. The tool that she has to work with won't quite do it and we need to manipulate the insides of the tool to make it work for what she needs. I'm doing that, but in order to do that I have to work directly with the art." So who's doing what? The talent needed is not being produced by Minnesota training institutions. Everybody is looking for C++ programmers, and our Minnesota institution suppliers haven't figured out that this is the language to teach. We still have programmer schools, Minnesota institutions requiring programmers to take a course in COBOL. Why? Our University of Minnesota is either focused on turning out people to do systems work or do programming in large system places, or AI -- artificial intelligence. What we have is a very practical need for people who can do graphics programming and C++ programming for our core business. I'm working diligently with training institutions to get

their awareness level up. The talent shortage is a disadvantage. The flip advantage is that the economics are better here for personnel, and we don't have competition. If there is a qualified individual we can have a pretty good chance of hiring that person, whereas in the Silicon Valley companies hire away from each other all the time. All the competition for C++ programmers here is tremendous. U.S. West has 70 openings. Vance Opperman at West Publishing told me the other day he's got a couple dozen openings, and he can't find a one. We've got ten MECC openings and we can't find applicants. I think there's a disadvantage in being the "flyover state." In Minnesota, we don't get in on the deals that they cut over lunch in Silicon Valley. We're always a day late in terms of the information. It happens Wednesday in Silicon Valley and we don't hear about it until Thursday. Silicon Valley is not the only hotbed. Seattle is just as important as Silicon Valley. We do have outside external development shops and they're out on the West Coast. MECC does have a Seattle office.

O'NEILL: Okay. Is there anything else you want to add?

LAFRENZ: No, I've said all I can think of.

O'NEILL: Well, thank you very much.

[END OF INTERVIEW]