STEVE MARKMAN
ORAL HISTORY

COMPUTERWORLD HONORS PROGRAM
INTERNATIONAL ARCHIVES

Edited Transcript of a Video History Interview
with Steve Markman
Chairman, CEO & President,
General Magic

Location: General Magic HQ
Sunnyvale, California

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

DSM: Good afternoon. It's December 13, of the year 2000. We are interviewing Steve Markman, the Chairman, CEO and President of General Magic, Inc. The interview is taking place at General Magic headquarters in Sunnyvale, CA. The interviewer is Daniel Morrow. This interview is a part of an ongoing series and oral histories in video biographies of the leading figures of the information technology revolution, begun in 1988/89 as part of the partnership between Computer World of the information technology industry and the Smithsonian Institutions National Museum of American History.

Without objection, this interview will become a part of the public record and will be made available to academic and research institutions in the United States and throughout the world, and to the general public online. This interview is private, however, and should Mr. Markman wish to embargo any or all of it, those wishes will be honored for a period not to exceed twenty-five (25) years, and those who remain in this room for this interview, by staying here, accept both professional and legal responsibility for honoring that request. No mass exits from the room -- I'd like to begin at the beginning and have you tell us when and where you were born, and something about your parents.

SM: I was born in what I like to call the cradle of civilization. Most people then ask me, "Oh, Mesopotamia? That's very interesting." I'd say, "No, Brooklyn." So, I was born in Brooklyn, New York. I was born actually between VE and VJ day in 1945.

DSM: So between May and August.

SM: Right, exactly. One of my memories of all of that isn't of when I was born actually, but rather many years later, my mother opened up this box of memorabilia with pictures of FDR and all kinds of interesting stuff. Included in there was a ration book, which I still have today. In fact, I have all the ration books in the family, but there is a ration book there that says, Steve Markman. So as a baby, I got my own ration book. I started looking through the ration book itself and noticed that all the coffee stamps were gone; all the sugar stamps were gone; and all the cigarette stamps were gone. I knew I was a little too young for that kind of stuff, so my parents took advantage. It was one of those things you could do when you had ration books, I guess, and you had a baby.

DSM: How large was your family?

SM: It was really four people: my mom, my dad, my brother, who was older, and myself. I won't say he was considerably older because then I'd have to embargo that, and that would be terrible. [laughter]

DSM: Tell me about your dad. What did he do?

SM: Both my parents were very, very hard working people. They were born in the 1912 timeframe, so they lived through the Great Depression. They lived a pretty hard life through that, and learned a lot about the meaning of hard work, and so on. They had a value structure around that, one that respected money, but didn't need materials things. Family was very important, so both of them were very family oriented people. They were very loving of their children, and made it very clear that that was the case.

DSM: Were they born in the United States?

SM: Neither of them were born in the U.S. Both were born overseas; my father, near the town of Kiev, and my mother, somewhere near Warsaw.

DSM: When did they immigrate?

SM: My father immigrated when he was five years old.

DSM: On the eve of the revolution?

SM: Basically on the eve of the revolution, right. I would hardly say he was immigrated. He was stolen from the country. What happened was that my grandfather had left with the older siblings. He came to the United States to earn a living and then wanted to bring the mother and two younger children over. In the ensuing year or two, my grandmother got ill and died. The two children were put in an orphanage in Kiev.

So they lived there while the father saved enough money to hire agents to get them out and cross the border into Austria and then into France. My father was five years old at the time. He lived in Paris, which was pretty neat, and then came to the U.S. My mother came well before World War II.

DSM: So your parents me met in the States?

SM: They met in the States, probably around 1917 or so.

DSM: Do you have Uncles?

SM: I have lots of uncles, lots of aunts, relatives all over the place. There were a few who never made it because the Nazi's did their thing. The Russians did their thing. Quite a few of them were already over here, and I had quite a few close relatives, bunches of uncles and aunts, all of whom totally spoiled me, I have to admit. They also lived in this foreign country called the Bronx, which to go and visit, you had to take a long subway ride to get there. We were a very close family. We would meet very, very often and have meals and joke around. I remember one of my uncles used to work at Yankee Stadium, and of course, we were from Brooklyn, so this was a constant source of argument. It was terrific.

You had asked about my father and what he did. He was a craftsman, and he ultimately expressed that in the form of making men's belts. He was a leather craftsman, and knew how to sew and put together belts. He eventually became foreman of a very substantial men's belt factory. He helped launch a seatbelt company, which by the way, still ships seatbelts into airplanes. You look on the back and it says American Safety Equipment Corporation. That was the company that my father was involved in very early on.

I probably also should mention my mom in all this too, because there's kind of a theme here and that is that my mother was a true artist. She was a seamstress and she worked on women's dresses primarily. She ultimately made all kinds of outfits for my wife, which was quite interesting. She was a very, very hard worker but a real craftsperson. She sewed so beautifully that they made her into what they call a sample maker. That is she made the samples for salesmen to go out on the road and show the dresses. They all had to be perfect, so she was an artist. The two parents both being artists, and only my brother turned out to be an artist.

DSM: I was going to say, you were more on your father's side, and you brother --

SM: I'm actually more on my side. My brother is definitely part of the family. If you looked at the family pictures, you would say, "You look just like your mother, Steve." I have a lot of the characteristics from my mom. But in many ways, I took a different path. It wasn't the artistic path. I think it was because everyone else was so artistic that there was no way I could be. It was perhaps one of those competitive things. I don't really know.

DSM: A question I'd like to ask is stories that people tell on their kids that were early signs of what they were going to grow up to be like. Patricia asked me to ask you about Erector Sets. Are there stories like that, sort of early hints?

SM: I was definitely into construction toys of one kind or another. The Erector Set was a key tool that I used to express myself. I would follow all the little diagrams that they had for all the usual crafty things that you could do with Erector Sets in those days, Carousels, this, that and the other thing. Then I said, "You know what, this stuff is boring." Then I just went wild and created my own stuff.

That's when outside observers looked in and said, "Steve, this is really amazing. It's not in the book. How did you do this?" That's when I became aware that I had an interesting talent that I didn't quite know where it came from, how I got it, or what the interest was. But it's one of those things that through reinforcement, it just became a very natural thing.

DSM: How old were you?

SM: I must have been seven or eight, somewhere in that range, when I first started with that. Then of course I moved up to building skyscrapers out of these little blocks, I think it was called the Skylane Series of Blocks. None of these things are available anymore unfortunately. They have other things nowadays, but these things were really terrific.

DSM: We're about the same age, and myself, I didn't start school until I was nearly seven. When did you start your formal education?

SM: How do you define formal education?

DSM: Let's say public school. Did you learn to read early, before you went to school, for example?

SM: I honestly don't remember when I started to read. I do know that my parents were getting to a point where my mom didn't have to work anymore. They had a little extra money. They invested it in some businesses, which didn't quite make it. It turned out that they invested in the limousine business to take people from New York City to the various country areas, upstate New York, the Catskills and New Jersey, so on and so forth.

The year they chose to go into business was the year of the great polio epidemic, and nobody was leaving the city. Nobody wanted to congregate. Everyone was afraid of catching polio, so my parents had basically no business. They went out of business, and my mom had to go back to work. What I remember most is when she had to go back to work, and was no longer in my life that way, and she wasn't around all the time. I had to go to a private school, which went from K-6.

DSM: So your earliest memories of formal education were of being taken out of your family?

SM: Ripped out. I remember only one thing from kindergarten, and that's making a traffic light. They were trying to teach you how to cross the street, red light, green light, yellow light, that kind of stuff. That's my last memory of public school until I was old enough to go to public school and my mom didn't have to worry about whether I was getting home okay and that kind of thing.

In fourth grade I had a wonderful teacher whose name was Edna Fried. The only reason I still remember her name, even though she was a darling women, was that was also the year of Hurricane Edna. We all thought that was coincidental. She was herself artistic and caused us to do all kinds of interesting things in the classroom. She was a very, very nice person.

DSM: Another common theme with our Oral History interviewees seems to be chemistry sets and a fondness for making things that blew up and smelled bad. You had similar experiences, I gather.

SM: It's one of those things. My parents realized that I was different. They bought my brother all of these artist's materials. He is today a commercial artist with a fantastic sense of color and design. He's been an idol of mine because I just don't have that kind of talent. My talent, for whatever reasons, developed along completely different lines, maybe artistic in itself, but very different. My parents realized that I had this talent. They did the Erector Set thing because, quite frankly, everyone had Erector Sets. How could I not have an Erector Set? Then I started doing these different things with it, and they realized it was is good, "We should encourage the science thing." One Hanukkah they actually went out and got me this massive chemistry set. This thing was huge. It folded out, had six shelves, hundreds of bottle and test tubes, litmus paper and stuff like that. I think it was called the Porter Chemical Co. used to make these sets. I don't know if they still do.

It also had a microscope. It was an amazing little set. I loved this thing, and did every experiment in the book. Then I was totally bored and went on to create my own experiments, which is what began to horrify my parents. As I got older and earned money, I really enjoyed chemistry a lot. I went out to this place in lower Manhattan on 23rd St. to this place where you could buy any chemical you wanted, equipment, and you name it. They had everything. I would invest my own hard-earned, paper delivery money basically.

DSM: Oh, so you had a paper route?

SM: I had a paper route, yes. I also worked in the belt factory in the summer times. There was no vacation. It was belt factory – and that was money, very important stuff.

DSM: What paper did you deliver?

SM: It was the Herald Tribune back then.

DSM: Oh yes, a fine old paper.

SM: Exactly. I had this massive amount of money, you know. I invested it in chemical equipment and scales and so on, which I ultimately passed on to some friends. Interestingly enough, about 30 years later, it's all come back. It's now back in my house. The guy brought it back, he was so grateful. He's an engineer at Lockheed of all places. He's launching satellites and it's really amazing. I guess I had some influence on the poor child. I was really into it. I had a lab in the corner -- fortunately, my brother had gotten married and moved out, so he didn't have to put up with any of this -- but I had my own corner in this big bedroom, and I had condensers, and Erlenmeyer flasks, and Bunsen burners and tripods. You name it. I had it all. I did all kinds of very strange things, and concoctions, with neat smells and odors. Nothing exploded, fortunately. I hadn't learned enough about organic chemistry to get really dangerous at that point. That wasn't until college. [laughter].

DSM: We'll talk about that in a minute. There was a mention of some dangerous World War I gas. You were about 12 years old though, growing up in Brooklyn, through the Eisenhower era, and this was really was sort of a Golden Time, but in 1957 there was shock.

SM: Yes, Sputnik.

DSM: Tell me about that, and the impact that had on young males in America.

SM: First of all, they talk about the Golden Age of Brooklyn, or New York for that matter. Where I lived was a street called Ocean Parkway, which connected literally the Atlantic Ocean to a beautiful park. It was an old historic park called Prospect Park, which had a great lake for fishing, which we took advantage of. Weren't allowed to swim in it, but you could fish in it. I never could quite understand that. We would get in row boats and fish out there. It was a famous, historic battleground of the Revolutionary War.

Brooklyn is filled with these kinds of sites. There are amazing places in Brooklyn. There was this one road, which literally was six lanes wide. One side had a bridle path, and you could ride horses from Prospect Park to Coney Island and back. On the other side were benches for people to sit on and a bicycle path. So you could ride bicycles back and forth the same length. It was quite long, and they had these little Roman mileage markers.

DSM: So, you could bicycle to Coney Island?

SM: Oh yes, back and forth and all around.

DSM: How long did it take for you to bicycle from home to get a Nathan's hot dog?

SM: About an hour or so, and you could work it all off going back. The problem was that it wasn't just the hot dog, it was the french fries, or what they called french fries. They were really good, can't get those anymore.

DSM: An American institution.

SM: That was a very warm, wonderful place. It was grown over with these very old, 125-130 year old trees that literally formed a canopy over the six-lane roadway. It was a wonderful place to grow up with very secure, very tight-knit families. Most lived in apartment homes; 90 families to an apartment house situation. Lots and lots of kids to know and either love or not, as the case may be. You had lots of friendships and a very warm, almost cocoon-ish kind of place. It was after the war, so they still had wooden station wagons back then.

It was a wonderful place. I've got old 8mm films of me as a child roaming the streets down there. My father was a photographer. It was a very interesting time. I had just gotten back to public school and the year after, people started talking about something called the international geophysical year. Eisenhower had taken the path of wanting to have scientific research based on civilian built missiles as opposed to the military built missiles, because we had those, they worked. The Redstone Missile, in particular, the old workhorse. But he insisted on starting this brand new program from scratch and Wernher von Braun was saying, "You know, it takes time to develop this stuff."

Sure enough, unbeknownst to us, the Russians were going down their merry way with their military missiles and they had launched the first satellite, Sputnik. That was like, {shiver}, "You mean the Russians can see us from up there?" It was just this little ball and couldn't do much of anything except broadcast propaganda, but everyone was scared half to death. It was a real, real problem. Here we are in public schools, lining up against the walls, worrying about protecting yourself from nuclear blasts -- like that was going to help.

DSM: Crawling under your desk [laughter]

SM: Exactly. Everyone was really scared. It was a very scary time. I remember this one Life Magazine, which showed an American classroom, an American teacher, and a bunch of American children. The headline was very negative, about just how poor science education is in the United States and what are schools going to do to catch up because, after all, the Russians were doing "these terrible things." It was feeding the paranoia. That really took me and shook me a lot.

It was, I think, the thing that turned an interest in science into a passion and this driving force to save the world, to contribute to mankind, those kinds of motivations. I remember that so clearly as though I was still sitting in the chair, when this thing happened. I know that it had a big impact on me because I can still remember it.

DSM: Did your dad, coming from Russia, and your mom, from Poland, did that reinforce that, do you think?

SM: It might have, but my father left Russia when he was five. They both left when they were so young that I don't think it influenced them -- other than the great recipes. I have to tell you, Borscht, no way -- I'm not doing the Borscht. My father could eat it, but not me.

DSM: So you enter high school, a pretty special high school. Tell us about Erasmus Hall.

SM: Fabulous school. While we were there, our graduating class, we had five National Merit Scholarship finalists. It had a very intellectual orientation and a fabulous set of teachers. The school itself was a remarkable building. I've talked about Brooklyn, and some of the things that are in there. Across the street from the school was this Dutch Reform Church that was built in the 1600s. You could go there and see gravestones marked 1632. It was a very, very historic area. Of course, the church had been rebuilt several times since then, but it was still there and had an influence on everybody from an historical point of view.

The school itself started from a little building that was in the center that was the administration offices, but it was the original school, built in the 1700s, as a riding academy for American and British children. They built the quadrangle around it, four concrete buildings around it, but it was built in the gothic sense. It had gothic archways and gargoyles up on the rafters. It had towers and classrooms that you could only get to by going up, down, in and around all these stairs and corners.

DSM: What a great place to go to high school.

SM: It was unbelievable. I remember having an English Literature class in this room and turning my head as the sun was going down and there was this gargoyle doing one of these things....[laughter]. It was a wonderful place to grow up in and to learn in. It was a classic, old school with these huge rooms and wooden, creaky floors.

There was a chapel that, I think, rivaled most churches. It had beautiful stained glass windows, an area for a choir, and we had a fabulous choir. Of course, if I didn't mention the basketball team, I'd probably get trounced. We had a great basketball team. I know because they would beat me up.

DSM: Speaking of 1957, the legend of North Carolina was that the roughest, toughest Tar Heels in the United States of America were all from Brooklyn, New York.

SM: Well, there you go. Recently I was at COMDEX. My wife was with me. We'd got in a taxicab with this fellow, and as soon as he opened his mouth we knew he was from Brooklyn. We got into this conversation and it turns out that he was a year ahead of us at the school.

DSM: Okay, we we're talking about starting at Erasmus just two years after Sputnik was launched and being there during the Kennedy campaign and his election. Talk about that and the atmosphere of the time.

SM: It was exciting and dynamic. After all these years of Eisenhower, the great man that he clearly was and a very, very smart President that he was, I was also too young to appreciate him anyway near as much as he deserved. He was very stayed, very tight. He was not the most ebullient person you've ever met in your life, so I think that the country was electrified by Kennedy. He was so alive and dynamic and represented a whole new world. I'm sure, just like you, since we are contemporaries, there was that bond, that hope.

DSM: And a real faith and signs of the future, as a contemporary.

SM: Absolutely.

DSM: You also met a young woman at Erasmus that became a very important part of your life.

SM: Right. Patricia, also known as Patty.

DSM: How did you meet?

SM: We met in chemistry class, strangely enough. We had both been in a special program in New York City that allowed us to in essence, skip a year. It eliminated the eighth grade. So you kind of had a 7 1/2 grade and a 9/10 grade. They had a junior high school, which ended in 9th grade. So by the time we actually went to high school, we were already in 10th grade and considered sophomores, nor freshman.

One of my first classes was a chemistry class. It was taught by Mrs. Cayman, who was just a fantastic teacher. She was, gentle soul, but a very effective teacher. Sitting in front of me was this young lady who on the very first day turned around and said, "Hi, my name's Patty." That was 40 years ago. We've known each other for quite a while.

DSM: Someone said that when you were in high school, things didn't always go particularly well. You had some trouble with French and what was it that your mom called them? You fell in with the "wrong crowd." What's the story?

SM: Very interesting. Well, the problem was, what's very interesting is that sometimes success is your worst enemy.

My first semester in high school was extraordinarily successful. I did very well in French, and they decided to put me in an honors French class. The teacher of the honors French class, and I don't like to dwell on negative things, but there are teachers who are very positive influences on you, and there are teachers who are not. This teacher was not. She was mean; very, very mean, very, very demanding, and there I was in an honors class of hers. Oh my God. I never considered myself particularly facile with languages, but I was doing okay in French. Somehow I got in this class, and she managed to destroy my self-confidence. Then I "fell into the wrong crowd". This is how my mom felt about some of my friends.

DSM: Were you wearing leather jackets?

SM: No, no, no. That was an extreme characterization. Basically, we cut classes and went to the movies.

DSM: Sinful.

SM: Very sinful, a very bad things to do. I paid for that, actually, but for a while there that semester, rather than go to that French class, I decided I was just not going to take that. One of my neighborhood friends who was part of "the wrong crowd", said "Well, let's just go to the movies." So we went to the movies. They had these wonderful old theaters back then. I'm sure that you have probably walked into a few of these palaces. We would do strange things like that. The guy was part of "the wrong crowd", and you should know that he eventually grew up and became an executive at the B'nai Brith's Anti-Defamation League.

DSM: Your mom would be pleased.

SM: She would be pleased. He did strange things like walk through plate glass doors and stuff like that. He was sort of klutzy, I guess is the right term to use. So that was "the wrong crowd", which could have been really bad, but it wasn't that bad.

DSM: You mentioned a couple of teachers that really made a difference: Joe Fisher, Mr. Bloom, Bob West; can you talk about them a bit?

SM: Yes, those guys were inspirational. They saw a lot in me and they pushed really hard for me to be successful, to stay engaged in school, and move along in a career.

In fact I saw Joe Fisher just a few years ago at one of the reunions. He's still the same Joe Fisher. He taught math. He had this habit of if you weren't listening, if you were talking in his class while he was writing on the board some important equation, he would just whip around and take that chalk, and just go "Whack!" He'd hit you every time. [laughter]

DSM: Fine Brooklyn training.

SM: Absolutely. Fine Brooklyn training. He also was a brilliant teacher and he ran an advance math class in calculus, which he thought I should be going to. He wrangled me into that class and I learned all kinds of wonderful stuff. He would do really strange things, like he would say, "Today ladies and gentlemen, I am going to teach you about civil rights." We'd all look around and say, "Wait a minute. This is a math class. What are you talking about?" He would say, "The topic today is integration." He would talk about integrals and stuff like that. He cracked really bad jokes all the time.

DSM: Bob West? Do you think you would have taken the Regents if it hadn't been for Bob West?

SM: I don't honestly know, but he really pushed me. If he wasn't there, I might not have done it.

DSM: For somebody from a 200 year from now perspective, we might talk about what the Regent's Examination was and how important was it?

SM: There is a very famous program in New York City called the New York State Regents Scholarship. The New York State school system was run by a Board of Regents, and they would meet and talk about different programs and where to make the investments and so on. They had a scholarship where if you took this exam and reached a certain level in the exam, you'd get a scholarship to go to college. With my parents both having to work it wouldn't be easy to go to college, other than a city university, which wouldn't be a bad thing, but in my case, the city university that I would want to go to was two hours away by subway. That's a long ride. The private schools, some of which were closer, were just way too expensive. Without the scholarship, I couldn't go.

Bob West, basically took me under his arm after this incident and kind of led me and pushed me and cajoled me into taking this exam and also managed to get me into a few other honors classes. So there I am going into more honors classes saying, "I don't know if I want to do this. Why is he doing this to me?" But it was very good for me. He got me to take the exam. I was figuring that there was no way I could pass that exam. I was really down. Yet the next day Bob West me into his office to say, "Guess what. We haven't posted these results yet, but you made it."

DSM: That's great. You applied to schools other than the Polytechnic Institute?

SM: Oh yes. I applied to, City University. I was actually offered a seat in the University. I was offered the same with what was then New York University School of Engineering, which was located up in the Bronx. That was pretty far away, and so was City University. It really wasn't what I wanted to do in terms of either the neighborhoods you had to walk through to go there, or the distance. It was just really hard. For my parent's sake, I wanted to live at home, because who wanted to pay for a dormitory? It just wasn't the right thing to do. Plus my particular interest at the time, had emerged from chemistry and electronics, into wanting to be involved with the work on fusion reactors. It was right around that time that there was a lot of work going on with a project called the Stellarator at Princeton University. They were having all kinds of terrible problems with getting the temperatures they wanted contained, and this, that, and the other thing. I thought this was really interesting stuff. When I looked around at the schools, CUNY was electrical engineering, NYU was analog computers, which we are now apparently getting back to, and it's really fascinating. But Brooklyn Poly had this graduate institute called the Microwave Research Institute, and there were some world-renowned scientists who did experiments there on electromagnetic waves and fields. This seemed to me to be a perfect match. They had a great reputation, and I went there.

The school was built inside the old Gillette razorblade factory of all places. It's an amazing school with great teachers in this fabulous facility. They also had a campus out in Farmingdale, Long Island where they did a lot of research in plasma physics, and that's the direction that I wanted to go in. That's the path I decided to take. With my Regents Scholarship and the price of tuition, it was a wash. It was a no-brainer, and it was only 15 minutes by train. How could you beat that?

DSM: So off to Brooklyn Poly. Was it a big jump from high school? I know when I went to school it was definitely terrifying. Was it harder for you, or were you so well prepared out of Erasmus?

SM: Erasmus Hall prepared you very, very well. I had already been in calculus. I had an advanced earth science course. I had this very advanced geometry course. These were all honors courses. Believe it or not, I had gotten that same French teacher in a non-honors class, and got her turned around on me, but I was very well prepared going into college. I knew exactly what I wanted to do. I was very driven -- still am driven. I owe it all to Sputnik basically, but I haven't stopped being driven since that occurred. So, I was well prepared and it was so close by and it was familiar territory. That helped a lot too.

DSM: When did you make the decision to go on and get your masters and then Ph.D.? You had a very influential professor, Phil Seraphim. Did he direct your master's thesis and Ph.D.?

SM: No, he did not. He was strictly undergraduate, but a very articulate man, very caring man. He very much encouraged me to go on. He thought I had a talent and dedication to that craft basically. He very much encouraged me to continue. He was also instrumental in the formation of a graduate program in what they called electrophysics. So, again electromagnetic theory and plasma physics and so on were all being combined, part from physics and part from electrical engineering, into this new discipline. This was in the days before there was computer science. We had computers, but no one considered it a science, I guess. Information technology was only starting to show up in significant ways in schools.

So, he encouraged me to continue. My strongest desire was to get a masters degree because the entry level at Bell Laboratories. You could go to Bell Laboratories with a Bachelors, but it took forever to move to the appropriate levels, and to be considered serious, you needed to walk in with a Masters degree or a Ph.D.

DSM: So you finished your Masters and then went to work for Bell Labs?

SM: I finished my Masters then joined Bell Laboratories.

DSM: Working for Bell Labs is a dream job. Tell me about the connection between you as a Master student at Brooklyn Poly and getting into Bell Labs.

SM: It was an absolute dream. I took a pay cut to go to Bell Laboratories. I had several job offers after my Masters degree, to go work in the aerospace industry, which was very strong on Long Island in those years, but much less so today. The graduate school that I was working in was in Farmingdale, Long Island and it was a hop skip and a jump from Drummond Aircraft or Public Aviation or Airborne Instruments; all of these names from the past in some sense. It was very tempting. They were offering a fabulous salary, $12,000 a year. It blew me away. I went to Bell Laboratories to interview, and I got a job offer for $10,400, and I'm like, "Hmmmm, $2,000 a year is a lot of money." But I said, "I have to go to Bell Laboratories". It was actually an easy decision even though economically, it was a hard decision to make.

DSM: Who hired you at Bell? Do you remember the interviews?

SM: I worked for a fellow by the name of Bob Pissina. Bob had been a long time supervisor at Bell Laboratories. I joined and worked for Bob for three weeks, and Bob left. That sounds like Silicon Valley. They reorganized basically, which is the historical pattern at that company. A fellow by the name of Jerry Depiaso, who was a big influence on my life, actually, joined and he had been on Kwajalein Atoll. I don't know if you watch the History Channel from time to time --

DSM: Terrible marine battle --

SM: Kwajalein was turned into a missile test site. Bell Laboratories was one of the contractors, if you will, for Western Electric and Sandale Laboratories who were the prime contractors for the development of antiballistic missile defense systems; programs like NIKE-X and Safeguard, this that and the other thing. I joined Bell Laboratories at the height of the frenzy and the concern about "Gee, we have to build these systems to protect ourselves." So once again, we were saving the world for democracy, and I was at Bell Laboratories working on this stuff. Jerry had just come back from a two-year rotational assignment on Kwajalein developing and running these very high, massively high-powered phase to ray radars, the most advanced work in electromagnetics that you can imagine at the time. It was very exciting and important work.

Jerry came in, and his nickname, by the way, was "the old gizmachi". He was obviously Italian, and that was his nickname for himself, so we all called him that because that's what he wanted to be called. Jerry was just and incredibly creative, exciting, entrepreneurial guy and he actually went off and formed a company; was a founder of one of the companies of what became what is now direct TV. He used satellite systems and had a very interesting career. He just inspired the living daylights out of me. I worked harder for him than just about anybody else I think. We did all kinds of very, very interesting things; including when Bell Labs decided that there are other people that could do this kind of defense work, and we should kind of turn our attention to telephony, where we make our money. When Bell made that decision, his group, which I was part of, got moved into the group that began taking the very first measurements to prove out what is now cellular telephony system.

DSM: What years are we talking about?

SM: Oh dear, that would have been 1970. Literally, we bought these huge vans and we stuffed them with exotic equipment that Hewlett Packard built for us to make measurements. And we set about going up and down the hills of Allentown, PA measuring signal strengths and things of this nature, to get some sense of how you could actually design a cellular telephony system. The concept had been proposed in these articles by some Bell Laboratory personnel, but the question was, "How do you make this thing really work?"

It was a really new concept, and a lot of fundamental research had to be done to figure it all out. I was in there right at the very beginning, and I was excited about the concept of having a mobile telephone. It wasn't that mobile was new. People had radios, but you can only have ten subscribers in all of New York City. It gets to be pretty expensive. Who can afford a $100,000 telephone? That was an interesting time. We were there to create the ultimate inexpensive telecom.

DSM: I skipped a question that I really always ask. You talked a little bit about it when we were back at Brooklyn Poly. What was the first computer that you remember playing with, or working on?

SM: In a way I was playing because I was learning how to do Fortran for programming. This is really dating myself. I don't remember the name of the computer, but it took an entire floor of the school. [laughter] It had punch cards --

DSM: With hanging chads?

SM: Hanging chads, yes.

DSM: This is the December 13, 2000h and we just had an presidential election here in the 20th century.

SM: 20th century election with 18th century tools. At least we had punch card machines. They don't leave chads. They just punch all the way through, none of the senior citizen stuff.

DSM: The other thing that you have mentioned several times is making the world safe for democracy. You were in high school, college and graduate school in a pretty revolutionary time in history of the United States as well. John Kennedy, the President, was killed in '68. There was the Civil Rights movement, and we were at the height of the Vietnam War when you went to Bell Labs. Did those phenomena touch you directly in any way, or were they just sort of part of the overall environment in which you found yourself?

SM: Well, the whole Kennedy era, and then his assassination, I think everybody who was alive then, knows exactly where they were.

DSM: Where were you?

SM: I happened to be in a physics lab. We were all just stunned.

DSM: What about the Vietnam War? Were friends of yours drafted?

SM: High school friends were drafted. I don't know whether you would call this fortunate or unfortunate, but living in Brooklyn sort of had an advantage. Thousands and thousands of young men were to get drafted and go off to war.

DSM: So the odds.

SM: The odds were relatively low. When I joined Bell Laboratories, of course, in the midst of these defense programs that were considered absolutely essential, there were deferments associated with that, but that lasted for a small period of time. There was one year when I was completely open to the draft, and just by luck of the draw, did not get pulled in.

I was not directly involved in the Vietnam War, and for that I am quite grateful. I remember seeing one of my friends on TV. He was being interviewed on the ground; interviewed literally, I think by a CBS reporter about the situation and his observations. I said, "That's Jessie. That's Jessie. I don't believe this." There he was. That's about as close as I came to any impact at all. I knew lots of folks who were veterans of that war, obviously. I worked with them quite closely in the years that followed that.

DSM: When you were with Bell Labs and then AT&T, one of the interesting things in your background is that you talked about how much you enjoyed being a product manager rather than a functioning scientist at Bell Labs, the premier lab in the United States. Tell me about -- how did you make that transition?

SM: Bell Laboratories certainly was, and maybe still is, in those years a very interesting place. It had very, very deep research. You could argue the research was totally unrelated to the business that AT&T was in. It was what we might call fundamental research. A lot of that fundamental research resulted in technology that the company was able to capitalize on and create new products with. That was one part of the Laboratories, and I functioned in that part of the lab for quite a few years. We were always pushing the edge of the envelope. Whatever we were doing, we were pushing the edge of the envelope.

That was very, very exciting, but you couldn't always see the end product. For example, all the work that we did on advance design and development of micro-integrated circuits for these radar systems, all we were able to do with that was prove that you really can't defend against these missiles, and you shouldn't be spending money doing this stuff. You should sign a treaty. A treaty was signed as a direct result of all that research. That's the end product, and actually I think, a very good end product. An engineer is there to see the product get done, produced and being used. That didn't happen very frequently.

Then there was another part of Bell Laboratories, which was the systems engineering side of Bell Laboratories. These were people who had to understand what the customer wanted, had to convert that into development requirements and had to drive the creation of the product, and then the delivery of the product to the customer. It was all very technically oriented stuff. It was kind of a beautiful way to take you out of the lab, and into the real world and learn how to talk to customers and work with customers.

Then, when I left Bell Laboratories on a rotational assignment, which lasted five years in the operating units of the company, I found myself in the marketing department, doing product management, where I would talk to customers, write the requirements, bring them to the labs, negotiate the delivery and then help in the delivery of the goods.

DSM: Okay, you had just become a product manager, you were working in product management. What's the first product you managed?

SM: Strangely enough, it was a network management product. It was all about customers and their desires to manage their telecommunications costs themselves, as opposed to relying on the telephone company to do it. So I was building now, on the basis of these very early microprocessors, programs that would allow them to control their communications expenses, address books, and all the precursors to the things we now know as Palm Pilots, that we needed these massive and very expensive systems to deliver.

This whole period of time at Bell Laboratories was really the very early stages of the development of what we now call information technology. They just started getting in, when I joined them, these big IBM 360s and things of that nature. Time-sharing got introduced in this timeframe, and that's where I started using computers very heavily in the design of these advanced circuits, the very early stages of CAD/CAM if you will. Then that just grew and grew, and got more and more complex and we were able to do more and more things.

I finally became a product manager now and was able to build on these micro-processor controlled systems and giving customers the tools to do more and more with their resources. Actually beginning the very first Apples and the IBM PC, to be used as a product manager and actually developing sales tools. The most revolutionary product was VisiCalc. We were actually able to take and create the sales tools. I built configurators for PBXs, and for all kinds of systems. So a salesperson can go say, "Well, how many analog telephone lines do you want? How many digital phone lines do you want?" Boom, out would come a price - a quote. Then you're able to sell something to a customer.

This whole period of time when I was at AT&T--this was the dawning of the age of the PC and the real development of information technology. It shaped my life completely. It got me to understand how important computers were and how important they were going to be. It really put me in the path to want to be out here in Silicon Valley to take advantage of that and make that whole arena develop even faster.

DSM: How did you, speaking of going from one exciting place to another, how did you and Hewlett Packard find each other in '86?

SM: Networking is the right term to use. I knew a little bit about computer networking at the time, but this is human networking, so it turns out that Bell Laboratories was starting to lose some people into Silicon Valley. A lot of them were people I knew and worked with very closely for, at that point and time, almost 20 years.

Someone asked them, "Do you know anybody who could do this kind of work?" HP was looking for systems engineering people, people who could understand how do you pull systems together. They wanted to get into the computer networking business. That's what got us together, so my name got passed along, got made an offer. My wife cried, and we moved out to California. The rest is history.

But what an exciting time! I joined HP and ran a little 150 person lab, building computer networking products. That was the same year that Stanford spun out the Cisco Systems. So, I had met the founders of Cisco and they were literally in my lab, and we were talking about this new concept called routing. I was right there at the beginning of the dawn of computer networking and its explosion. Bob Metcalfe was a few blocks away. It was a really, really exciting time. When I left AT&T, they were just beginning to get worried about this thing called Ethernet. Some wondered if Ethernet was going to eliminate PBXs. My conclusion was, no, it wouldn't. PBXs would eliminate themselves. But data networking was going to be really important. That's what really got me to listen when HP called.

There I was in the midst of creating all this networking stuff. We had this incredibly productive lab at HP that we took all the best practices we could find of software development. We were pouring out 40 products a year - all the different operating systems and all the different computers; it was the time when the International Standards Organization was creating this thing called OSI Networking. My bent has always been to create real things that people can use, and we took that OSI Standard Networking, and we turned it into products that could be used, as opposed to the hype coming from, pardon the expression, DEC and IBM. We just beat DEC by coming out with products that people could actually buy and use. There was one article in, I think it was InfoWorld, that came out and the headline was, “The Standards Base Networking is HP's Proprietary Networking,” because we were the only company producing real product.

That to me was sort of like the icing on the cake. Really great people did all kinds of wonderful products, we were very, very productive. But HP was a really big place. I had to get smaller and move faster and left HP for a small company called Network Equipment Technologies. I was into backbone networking again, data networking and voice networking and the convergence of the two. So, there I was again right at the part of the time in the development of networking where we are going from local area networks now into this massive wide area networks and moving to the precursor to what became the internet and building real systems in and around that.

It was a very exciting time, and again, information technology was critical in making all of that stuff happen - critical in driving our revenues because people wanted all their IT stuff connected together. It was just a bombastic growth period. Then I went into this really teeny tiny company that was building -- First Pacific Networks. That was at the forefront of what we now think of as cable modems. We were building the very prototypical stuff to use cable, to transmit telephone signals and internet connectivity as well. Then I took a little sidestep into the world of software.

DSM: To Novell

SM: To Novell, where Bob Frankenburg was the CEO. I knew Bob at HP. He brought me there actually to build big network solutions for AT&T, and Nikon Telephone and Telegraph, and the like. Again, we were moving now into the creation of intranet technology. The ability to use internet standard technology, but now for the purpose of interconnecting the locations of a company and allowing the employees to share information more effectively, and the like. So once again we were just riding this wave of the development of the technology. It was just an amazing period of time. All this stuff is developing, and I'm right there. It's really exciting.

So it was there at Novell actually that I first met the founder of General Magic, Marc Porat. We had talked about how some of their technology might be useful to us at Novell in creating this new internet based enterprise technology.

DSM: So you saw him off in a Novell perspective?

SM: Yes, yes. So, we got together and talked a lot about some of the technology that was developed early on at General Magic.

DSM: This was about '94/'95 or '95/'96?

SM: This would have been late '95. I think it was in November actually.

DSM: Yes, and General Magic was about five years old.

SM: Yes, they had just gone public in fact, and we were looking for ways where we could work together. It turns out that John Young, also someone I knew from HP, was on the board of Novell, and also on the board of General Magic. That's how the connection happened there.

So, I ended up with Marc Porat in my office and we were talking about various and sunder things. We ultimately decided that we needed to be based on much more of the internet standard technologies than what was developed here, which was very proprietary, very powerful, but very proprietary. We could see that Novell would survive if it didn't switch to the internet. That's the direction we chose to head, but because that connection was there, Marc had gotten introduced to me, he then began recruiting me to the Board of Directors of General Magic.

DSM: And of course General Magic was in the same situation as Novell, no internet focus. That's why you were hired.

SM: You know how supermarkets will do this loss/leader thing to get you in the store? I ultimately viewed this as, "Oh, you offered me the Board seat because what you really want to do is come recruit me for something else."

DSM: I heard General Magic, on the eve of your arrival, has been described in many ways, not all of them flattering. Try to describe what you found when you walked in the door.

SM: First, I had know about General Magic actually years before I met any of the people here. I had this very innovative user interface technology, which was also an operating system, what today we call PDAs or Palm Pilots and Pocket PCs. It was really the early stages of the development of those technologies. They had just this incredibly friendly, easy to use, wireless friendly technology that could repair itself. You never even had to think about it. You could send bug fixes wirelessly to the device and it would just repair itself. It was just amazing. I was like, "Whoa, this is the future. This is what the world is going to be someday, that all the stuff will just repair itself, and no one will have to think about it. It just works." Then the interfaces were so extraordinarily friendly.

I don't know if you have every seen Magic Hat in operation, but they had walking lemons, and all kinds of very fun, interesting, consumer-ish kinds of things. It was a completely major departure from the way computers were built and a lot of the people had come out of Apple Computer and had built the Macintosh GUI. They were here, and they had developed that stuff. I knew about it and I was really excited about it. I wanted to work here, and eventually became the CEO.

The focus of the company was on building the electronic marketplace. That was Marc Porat's Ph.D. thesis actually, and he was going to do it by building these devices and then building the network to support it. It was basically the precursor to what we now think of as e-commerce. That was the original idea, except they went down the proprietary path because there was nothing there at the time. Once the internet showed up, it was sort of like, "Uh oh, what do we do now? What's Act II? How do we shift over?"

DSM: Creative destruction, I guess.

SM: Yes, so when I came here, what we had were hundreds of ideas for things that we could take the company in, in terms of direction. But what I saw was a core competency in user interface technology, a core competency in really the basic functionality of a PDA, which is what people call PIM (personal information management).

During my last few months at Novell, there was this company that you may remember called Corel, who, I don't know if they invented the term, but they claimed to be an application server provider. They were going to take all these technologies and put them on the network and let you share them. That idea, plus the fact that we had core competencies in PIM and in user interfaces, that's what developed into this idea of what became the Portico Service. The Portico Service is a networked based application, shared amongst many users to make it ubiquitous and inexpensive for anyone to use, but had PIM functionality and great user interface. We added this concept of the voice user interface to it as well. Our feeling was, you shouldn't be limited to a device where you got to poke things and write things in, but you ought to just be able to pick up the telephone and talk to it. We took that idea and developed it into a business, and through a variety of evolutions, understanding what the market would pay for, understanding where wireless data for the telecommunications carriers, we've evolved to this position of an application service provider who can build these very, very conversationally oriented, human oriented, easy to use user interfaces that links everybody's data together.

DSM: And you launched Portico a year and a half after you joined them?

SM: That's correct. We made the decision and the Board accepted the idea very early in 1997. By August of 1998, we had gone through two variations and launched the commercial version. We launched it, by the way, at the Las Vegas Hilton, at the Star Trek Experience. We thought that was an appropriate -- because every time everyone heard the demo, they said, "Wow, that's like Star Trek." We said, "Yeah."

DSM: It is.

SM: What I was really happy about is that they didn't say, "Wow, that's like HAL."

DSM: Speaking of Star Trek, take us from the launching of Portico to OnStar, to the announcement of that agreement. Where there key incidents during that period, and people that came on board -- I'm thinking of the partnership with Quicken and Excite -- that definitely let you know that you were going in the right direction. Could you just sort of walk us down that path?

SM: Sure. We launched Portico in July of 1998 and by the end of 1998, what we knew was that we had a winning proposition in many, many ways from a user experience point of view. What we didn't have was a business model that seemed to work very well because the cost was still too high to the end user. So, we began exploring other ways of taking out technology and know how and moving it into other spaces. We came across other companies like Intuit, who were looking for a voice enabling, various services including mortgage services and the like. We developed a discussion with Excite and then developed basically a whole new service for them. They were all email oriented, and they had no voice mail, no fax. They wanted a unified messaging service, which we were able to complete the pieces for them and we were able to host it here.

What we learned from that is that hosting was extremely important to people. The ability to create custom applications was very, very important. The ability to attach to the voice and the personality of the voice/user interface, the brand personality of the company that was offering the service in their name.

Those were very, very important learning experiences because from that I was able to develop a business model, which when presented to OnStar, resulted in them being very, very interested. Because to them, their connection to their end user customer was very important. They wanted to control their brand personality in terms of, "We are the safe company. We make life safer. We make life more convenient. We can handle emergencies," and so on. Those were all extraordinarily important attributes and that's basically what sold them, plus the fact that we could host it for them, and they didn't have to make the investment up front and could get into business quickly. All those were very, very important to get us to that agreement.

DSM: Perhaps I'm betraying my own prejudices by focusing so much on OnStar. How important do you think the decision to make it possible for all new automobiles to have access to the internet?

SM: Clearly, it's an immense decision. It has a lot of social implications, a lot of safety implications. As you know, as we speak, there are all kinds of concern about the use of what they call telematics, information coming into the car in lots of different ways. It's one thing if you have passengers, children in the back and so on, who are playing computer games and the like, and those are wonderful applications. But a lot of telematics today are aimed at the driver and if you distract the driver, as cell phones, hand-held cell phones, where you have to pick up and talk are very, very distracting and cause accidents and such. At least, that's the belief. There is a major concern about anything that would distract the driver.

I think there is definitely a big effort to get vehicles connected, and there's a tremendous amount that you gain from that. Safety is one of them. Telematics in emergency situations are very, very important, and something that is going to happen no matter what. That is very important to happen. And yet, you have to be very careful about the distractions.

So, there's a lot of controversy about navigation systems and such, but there are ways, and what I'm particularly proud of is taking out technology and shaping it and crafting it in such a human fashion that you get what you need without having to interact very much and without being distracted very much. Our linguists have put together an application that just does not require a lot of attention. It just kind of happens. You connect to it by asking to be connected to it. You don't have to press any buttons. It's active. You say, "Connect me to my virtual advisor." And the virtual advisor is designed to give you all of the information that you said you wanted on your website, and just continue to deliver it unless you tell it not too, and you say "Stop".

DSM: During our symposium and discussion last night we were looking for forces that were going to make voice application ubiquitous. Within certain economic parameters, there is nothing more ubiquitous than automobiles, and they do have, unless you're an antique collector, they do have a certain life.

We are talking probably less than 15 years, in which, practically every rolling vehicle on the road is going to be voice activated in one sense or another. Which leads me to one of the questions that I ask all of our interviewees in this program, is your vision of the future -- It's an unfair question to ask, but I ask it anyhow. What do you think it's going to look like, 10-15 years down the road, if voice enabled technology follows some of the paths we see it off on now?

SM: I think first it's important to understand that wireless networking and networked devices of all kinds are going to be quite prevalent. And whether it's a refrigerator talking to the power meter and changing its cycles in response to the need for power conservation, or it's a U.S. securities system relating that you left the water on in the bathroom, or whatever, everything is going to be wired or wireless into a network. That to me, is the first major element of the vision. Everything is connected, and now accessible from lots of different places; whether it's from a handheld device or telephone.

The telephone will play an important role. Voice communications will play an important role throughout all of this because it's just convenient and people are used to talking. It doesn't require anything new to learn. People know how to talk and can't stop talking. That is just a natural compliment to all of these other forms of communication, wireless data communications, or internet communication. Whatever term you want to use, whatever technology you want to think about. Voice is just an important element of all of this because it's the comfortable way that people are used to communicating. There are lots of people very facile with keyboards, but they are much more facile with their voices and they can communicate so much more easily with their voices. I think the future is that you are going to be talking to lots of devices and getting information when you need it, when you want it, just simple access. It will be literally a no-brainer. Anywhere you are, you can find out whatever it is you need to know, and control the things that you need to control, within reason, obviously.

So, I think that's what the future holds. It's a future of convenience in my mind. That's really what it's all about, convenience and packing more into your life, and being able to do more things. Giving you more time to do the things that you want to focus on and things that bring you joy. I see a wonderful world out there. That may sound very Pollyanna-ish, but you know, it will start to seep out there in lots and lots of different forms. People won't even realize it's happening.

DSM: I, again, betray my own prejudices. It's one of the most exciting times you could possibly imagine to be alive. On the other hand, both of us grew up in the middle of the 20th Century, which was sort of a terrible, bloody time in human history, any down side fears about this technology and it's potential. Is there anything out there that worries you about it at all?

SM: Well, which technology are you talking about?

DSM: Cultural terror.

SM: Cultural terror.

DSM: That's one of the topics we were talking about last night, the implications of all this for the Americanization of everything.

SM: I don't believe that's ever going to happen, to be honest with you. I think that we will be earth. The speaker last night was talking about adopting English as the common language for the entire world, and rename it Globalese. I thought that was very amusing. I don't know whether it's English or anything else. But I can tell you one thing, even if there was one language, there would still be many cultures because people are people. Looking at the United States, you tell me that everyone is one culture here. I just don't believe that's going to happen.

DSM: My last impossible question for graduate students and scholars looking back on this from the perspective of 100, 200, 300 years, how would you like Steve Markman to be remembered as a world player in this revolution?

SM: Well, frankly, I'd like to be remembered as an innovator, someone who worked hard, who had vision, who pursued vision very aggressively, who made some of that vision happen and contributed to what undoubtedly will be a wonderful world in 300 years.

DSM: Great. I can't think of a better way to end. Thanks very much.

SM: My pleasure.