

*Here is the full transcript [Edited version] of the YouTube video entitled **Steve Jobs: Lost Interview (1990)**. We produce here the transcript of the tape for the benefit of our readers.*

TRANSCRIPT:

[Audio starts abruptly]

Interviewer: What is it about this machine? Why is this machine so interesting? Why has it been so influential?

Steve Jobs: Hmm, I'll give you my point of view on it. I remember reading a magazine article a long time ago when I was twelve years ago maybe, in I think it was Scientific American. I'm not sure. And the article proposed to measure the efficiency of locomotion for lots of species on planet earth to see which species was the most efficient at getting from point A to point B. And they measured the kilocalories that each one expended. So they ranked them all and I remember that the Condor won - the Condor was the most efficient at getting from point A to point B. And humankind, the crown of creation came in with a rather unimpressive showing about a third of the way down the list. So that didn't look so great.

But let me do this over again, because I am just not sure.

Interviewer: Sure.

Steve Jobs: I remember reading an article when I was about twelve years old. I think it might have been Scientific American where they measured the efficiency of locomotion for all these species on planet earth. How many kilocalories did they expend to get from point A to point B? And the Condor 1 came in at the top of the list, surpassed everything else. And humans came in about a third of the way down the list which was not such a great showing for the crown of creation. And — but somebody there had the imagination to test the efficiency of a human riding a bicycle. A human riding a bicycle blew away the Condor, all the way off the top of the list. And it made a really big impression on me that we humans are tool builders. And that we can fashion tools that amplify these inherent abilities that we have to spectacular magnitudes. And so for me, a computer has always been a bicycle of the mind. Something that takes us far beyond our inherent abilities.

And I think we're just at the early stages of this tool. Very early stages. And we've come only a very short distance. And it's still in its formation, but already we've seen enormous changes. I think that's nothing compared to what's coming in the next hundred years.

Interviewer: In program six, we're going to look at some of the past predictions of why people have been so wrong about the future. And one of the notions is that today's vision of a standalone computer is just as limited as those past visions of it being only a number cruncher. What's the difference philosophically between a network machine and a standalone machine?

Steve Jobs: Let me answer that question a slightly different way. There have been, if you look at why the majority of people have bought these things so far, there have been two real explosions that have propelled the industry forward. The first one really happened in 1977. And it was the spreadsheets. I remember when Dan Fylstra who ran the company that marketed the first spreadsheet, walked into my office at Apple one day and pulled out this disk from his vest pocket and said, "I have this incredible new program. I call it a visual calculator." And it became VisiCalc. And that's what really drove, propelled the Apple to...to the success it achieved more than any other single event. And with the invention of Lotus 123, and I think it was 1982, that's what really propelled the IBM PC to the level of success that it achieved. So that was the first explosion was the spreadsheet.

The second really big explosion in our industry has been desktop publishing. Happened in 1985 with the Macintosh and the LaserWriter printer. And at that point people could start to do on their desktops things that only typesetters and printers could do prior to that. And that's been a very big revolution in publishing. And those are really, those two explosions have been the only two real major revolutions which have caused a lot of people to buy these things and use them.

The third one is starting to happen now. And the third one is let's do for human to human communication what spreadsheets did for financial planning and what desktop publishing did for publishing. Let's revolutionize it using these desktop devices. And we're already starting to see the signs of that. As an example in an organization, we're starting to see that as business conditions change faster and faster with each year, we cannot change our management hierarchical organization very fast relative to the changing business conditions. We can't have somebody working for a new boss every week. We also can't change our geographic organization very fast. As a matter of fact even slower than the management one. We can't be moving people around the country every week. But we can change an electronic organization like that. And what's starting to happen is as we start to link these computers together with sophisticated networks and great user interfaces, we're starting to be able to create clusters of people working on a common task in a.. literally in fifteen minutes worth of setup. And these fifteen people can work together extremely efficiently no matter where they are geographically. And no matter who they work for hierarchically. And these organizations can live for as long as they're needed and then

vanish. And we're finding we can reorganize our companies electronically very rapidly. And that's the only type of organization that can begin to keep pace with the changing business conditions.

And I believe that this collaborative model has existed in higher education for a long time. But we're starting to see it applied into the commercial world as well. And this is going to be the third major revolution that these desktop computers provide is revolutionizing human to human communication in group work. We call it **interpersonal computing**. In the 1980s, we did personal computing. And now we're going to extend that as we network these things to interpersonal computing.

Interviewer: Taking the long view now, what was the image of the computer in the mid 1960s or whenever you first saw one? And where are we now? What was the - how did the PC enact that change?

Steve Jobs: I first saw my first computer when I was twelve. I saw my first computer when I was twelve. And it was at NASA. We had a local NASA center nearby. And it was a terminal, which was connected to a big computer somewhere and I got a timesharing account on it. And I was fascinated by this thing. And I saw my second computer a few years later which was really the first desktop computer ever made. It was made by Hewlett Packard. It was called the 9100-A. And it ran a language called BASIC. And it was very large. It had a very small cathode ray tube on it for display. And I got a chance to play with one of those maybe in 1968 or '69. And spent every spare moment I had trying to write programs for it. I was so fascinated by this. And so I was probably fairly lucky. And then my introduction to computers very rapidly moved from a terminal to within maybe twelve months or so, actually seeing one of the first, probably the first desktop computer ever...ever really produced. And so my point of view never really changed from being able to get my arms around it even though my arms probably didn't quite fit around that first one.

Interviewer: What was the role — how have personal computers changed the landscape of computers? I mean back then it was centralized power, it was in a mainframe. Now we have three times as much power at the fringe than we have in the center, five times as much power.

Steve Jobs: I am not the right person to ask.

Interviewer: Okay.

Steve Jobs: Ask, Al.

Interviewer: How did the PC change the world?

Steve Jobs: Well, though the analogy is nowhere perfect and certainly one needs to factor out the environmental concerns of the analogy as well. There is a lot to be said for comparing it to going from trains, from passenger trains to automobiles. And the advent of the automobile gave us a personal freedom of transportation. In the same way the advent of the computer gave us the ability to start to use computers without having to convince other people that we needed to use computers. And the biggest effect of the personal computer revolution has been to allow millions and millions of people to experience computers themselves decades before they ever would have in the old paradigm. And to allow them to participate in the making of choices and controlling their own destiny using these tools.

But it has created problems. And the largest problems are that now that we have all these very powerful tools, we're still islands and we're still not really connecting these people using these powerful tools together. And that's really been the challenge of the last few years and the next several years is how to connect these things back together so that we can rebuild a fabric of these things rather than just individual points of light if you will. And get the benefit of both, the passenger train and the automobile.

Interviewer: What's the vision behind the NeXT machine? We've already covered this a little bit.

Steve Jobs: Everything that we've done in our — everything I've done with computers in my life has been along pretty much a single vector. And NeXT is just one more point on that same vector. Ah in this case what we observed was that the computing power we could give to an individual was an order magnitude more than the PCs we're giving. In the sense that people want to do many things at once and you really need true multi tasking. We really did want to start to network these things together in very sophisticated networks. So the technology to build that in became available. And most important we saw a way to build a software system that was about ten times as powerful than any PC. And where new software could be created in a fourth of the time.

So we spent four years with fifty to hundred of the best software people we could find building this new software system. And it's turned out beautifully.

Interviewer: What's the vision behind NeXT?

Steve Jobs: It's not so much different than everything I've ever done in my life with computers starting with the Apple II and the Macintosh, and now NeXT which is if you

believe that these are the most incredible tools we've ever built which I do, then the more powerful tool we can give to people, the more they can do with it. And in this case we found a way to do two or three things that were real breakthroughs.

Number one was to put a much more powerful computer in front of people for about the same price as a PC. The second was to integrate that networking into the computer so we can begin to make this NeXT revolution within a personal computing. And the PCs so far have not been able to do that very well. And the third thing, and maybe the most important was to create a whole new software architecture from the ground up that lets us build these new types of applications and lets them, lets us build them in 25 percent of the time that it normally takes to do on a PC. So we spent four years with 50 to a hundred of the best software people that I know creating a whole new software platform from the ground up. And the way our industry works is that you create this platform software first and then you go out and you get people to write new applications on top of it. Well the height that these new applications can soar is...is enabled or limited by the 8platform software. And there's only been three systems that have ever been successful in the whole history of desktop computing and that was the Apple II's platform software of which there wasn't too much. The IBM PC and Macintosh. So we're attempting to create the fourth platform software standard and hopefully we'll succeed because it will allow these applications to be written which far far exceed in capacity what can be done in today's machines.

Interviewer: What happens when you have a network that allows the relative minorities in a whole different area come together. How does that change the democracy?

Steve Jobs: I don't know. But what I have seen is I've seen interpersonal computing happening at our own company. Or maybe the best way to put it is, I remember when the first spreadsheet came out. I saw it fly through Apple as well as other companies. And when we invented desktop publishing of course it influenced Apple first. And I've seen the same thing happen with interpersonal computing here at NeXT. We decided to put a NeXT machine on every employee's desktop about 18 months ago and connect them with the very high-speed networking that's built in. And I've seen the revolution here with my own eyes. And it's actually larger than the first two. Let me give you some examples.

If we want to — if we're going to be doing a special project let's say with a company, and we — and let's say the company is called, what's your...WGBH. We're going to be doing a special project with WGBH. And what we'll do is we'll create a special mailbox, WGBH and we'll put twenty people on it that are going to be helping on this project. Now these twenty people will be from all over our company, from marketing, from sales, from engineering,

some from manufacturing. Maybe some from our Boston office so they can be close by. And if one sends a message to this mailbox, they'll all get it like that, instantly. And if one sends a reply they'll copy the whole mailbox so the rest of the team members get to read the intellectual content going back and forth. And everyone on this, in this mailbox will probably get around 30 mail messages a day. And they'll spend about twenty minutes, thirty minutes reading these and answering these per day. And it will be like a beehive.

Now this project is very important for our company and I want to make sure it's getting off right. So I'll put my own name on this mailbox and I'll see these thirty mail messages fly by. All of the disagreements and the arguments and the thoughts and the decisions. And I can just let it fly by and read it. I can do some background coaching with a few people if I think they're a little off track. I can get right on the network and kibbutz if I'd like. And after a month or so when I know that it's going well I can take my name off. And so not only is this a way to organize violating all management and geographic boundaries, it's also a way to manage where one can see. Again the thoughts, disagreements and decisions of a company fly by a manager in a way that they never could before. And we have seen it reduce the number of meetings we have at least by fifty percent. We've seen it get far more managers and individual contributors involved in decisions than there ever were before. We think the quality of the decisions is a lot higher. And we've seen a window for management to look into the process of this organism we call our company in a way that has never before been possible. As we become part of this electronically community that's going to provide us wonderful new capabilities and communications abilities. But we still always want to be able to disconnect that network spigot, take it off, and take our standalone computer somewhere, let's say home.

Now what's going to happen rapidly as with radio links and with fiber optics to the home, you're going to be able to hook your computer up to your network at home. But there's always going to be that cabin in the middle of nowhere that I want to go for a two week vacation where I want my computer. And if it doesn't work in a completely standalone way, I'm going to be not happy. So we have to provide a fluid way for these things to kind of dock into the mother load network, but also undock and allow me as an individual to carry my computer up into Yosemite backpacking. And where there's no radio links and no fiber optic links and still be able to use it and then come back and dock back into the network and find out what happened when I left and share some of my thoughts maybe with some other folks. So we're working on that. That's our goal for the next five years is that seamless transition between a standalone computer and the computer as part of this network community.

Interviewer: It also keeps away the welling aspects of always being hooked into the network.

Steve Jobs: That's right. I actually think what - an interesting paradox is the network which is ultimately going to define and create the home computer market. Not keeping our recipes on these things or something like we thought in 1975. Being a part of that network and not being able to stay away from it while you're home will drive people to get computers in every house just like we have a telephone in every house.

Interviewer: But computers then won't be just computers. They'll be radios, and stereos, and TVs.

Steve Jobs: No I think, I think they'll be just computers. Just like your phone isn't your television set. Just like your toaster isn't your radio. I think they'll be computers and they'll have many of the capabilities of these other devices. Multimedia, the ability to integrate sound and video in with the computer is absolutely coming. But a lot of people have mistaken it as the end rather than the means. We see multimedia as more of a means. In other words, people aren't going to buy a computer for multimedia. They're going to buy it for training. Or they're going to buy it for interpersonal communication. And in that communication, in addition to a text, they're going to want voice. They're going to want, potentially I might want to send you a video clip. But the real market is to help us communicate better, or to help us train somebody. And we need to not lose sight of that.

Interviewer: I want to get your thoughts on the user interface stuff. And I'd like to look at the transition - Xerox to Apple. When did you hear, what was the image of Xerox PARC and what was it like when you first went in there?

Steve Jobs: Well Xerox PARC was a research lab set up by Xerox when they were making a lot of profits in copier days. And they were doing some computer science research which was basically an extension of some stuff started by a guy named Doug Engelbart when he was at SRI. Doug had invented the mouse, and invented the Bitmap display. And some Xerox folks that...that Xerox I believe hired away from Doug or split off from Doug somehow and got to Xerox, were continuing along in this vein. And I first went over there in 1979 and I saw what they were doing with the larger screens, proportionately spaced texts and the mouse. And it was just instantly obvious to anyone that this was the way things should be. And so I remember coming back to Apple thinking our...our future has just changed. This is where we have to go.

The problem was that Xerox had never made a commercial computer. This group of people at Xerox was...was more concerned with looking out fifteen years than they were looking out fifteen months trying to make a product that somebody could use. So there were a lot of issues that they hadn't solved like menus, other things like that. And at Apple what

we had to do was to do two things. One was complete the research which really was only about fifty percent complete. And the second was to find a way to implement it at a low enough cost where people would buy it. And that was really our challenge.

Interviewer: What did you succeed in doing with the Mac?

Steve Jobs: Well the Macintosh as you remember when it came out, we called it the computer for the rest of us. And what that meant was that while experts could use some of the computers that were already out, most people didn't want — again the computer was not an end in itself. It was a means to an end. And so most people didn't want to learn how to use the computer. They just wanted to use it. And the Macintosh was supposed to be the computer for people that just wanted to use a computer without having to learn how to use one, spend six months.

Now it turned out that the paradox was that to make a computer easier to use you needed a more powerful computer in the first place because you were going to burn a lot of the cycles on making it easy to use. And so this computer that was easy to use was actually more powerful and could do more things than the less easy to use computer. And it took people a few years to figure that out about the Macintosh. But I think people did.

Interviewer: Actually there's a funny joke that we were clowning around one day and one of our group is an IBM person. And so he was saying, some little girl walks up and sees a prompt and goes to her daddy and says "it's broken". Where's my desktop? Where's...where's my metaphor. And we've gotten, we've...we've adopted this new metaphor. How has that changed the look of computers?

Steve Jobs: Well I think, I think the Macintosh was created by a group of people who felt that there wasn't a strict division between sort of science and art. Or in other words, that mathematics is really a liberal art if you look at it from a slightly different point of view. And why can't we interject typography into computers? Why can't we have computers talking to us in English language? And looking back, five years later, this seems like a trivial observation. But at the time it was cataclysmic in its consequences. And the battles that were fought to push this point of view out the door were very large.

Interviewer: The balance between thinking and doing. I mean one of the things in the semiconductors was you had risktakers. Bob Noyce learns to hang- glide at age 40. These people like laying their butts on the line. How important was that in the early days? I mean we're going back to '75.

Steve Jobs: Well again after seeing... my entire life has been spent only in one industry which is this one. And but I've been in it now for about fifteen years and I've seen a lot of people make a lot of things. I've seen a lot of people fail a lot of things. And my point of view on this, or my observation is that the doers are the major thinkers. The people that really create the things that change this industry are both the thinker and doer in one person. And if we really go back and we examine, you know did Leonardo have a guy off to the side that was thinking five years out in the future what he would paint or the technology he would use to paint it, of course not. Leonardo was the artist but he also mixed all his own paints. He also was a fairly good chemist. He knew about pigments, knew about human anatomy. And combining all of those skills together, the art and the science, the thinking and the doing, was what resulted in the exceptional result. And there is no difference in our industry. The people that have really made the contributions have been the thinkers and the doers.

And when you - a lot of people of course, it's very easy to take credit for the thinking. The doing is more concrete. But somebody, it's very easy to say I thought of this three years ago. But usually when you dig a little deeper, you find that the people that really did it were also the people that really worked through the hard intellectual problems as well.

Interviewer: What's it going to take to make computers accessible to the rest of the public? And I don't know what the statistics are but 20 million people on computers or What's it going to take to get it to a hundred million?

Steve Jobs: Well probably death is the best invention of life. Because it means there's a constant turnover. And so if you want to make a change in our society, the best place to do it is in the educational system. So that you're — there are, there are now generations of people that have come out of school who computers are second nature to them. And the people in our society that...that at this point still have, have not embraced these things are getting older, has that cycle, that wheel of birth and death turns, just like driving, people that don't drive are very rare. Another generation or two, people don't use computers are, will be pretty rare. It's a harsh way of saying it but...

Interviewer: It's very true. I mean there is a line that says those people that don't adopt it will die off. Focusing now on the third program where we've gone from semiconductors and the vision is that IBM is this big machine, UNIVAC, big large machine. And we take the line through an integrated circuit microprocessor. And I actually got some great stuff from Ted Hoff about, you know, it's a lightbulb. It burns out, you replace it. Then we lead up into the beginnings of the personal computer. So what were you doing at the time and how did that get started?

Steve Jobs: Actually you know, it wasn't Intel that first figured out that the microprocessor was a computer. They designed these things to be used in calculators. And they thought, the reason that the microprocessor came about was they thought if they could design a slightly programmable one, the next customer that walked in the door that wanted a slightly different calculator they could just spend a few months rather than a few years designing a new piece of silicone. But I think the thought of making a computer never really occurred to them. And it was the hobbyists that thought about making a computer out of these things. It was the computer hobbyists community that first did that.

And I don't think Intel quite understood that for a few years. But again the first thing that happened was these people came together and formed a club, the home group computer club at Stanford was the first one in the country. And it was a beehive of all of these people who were interested in these small little computers. People that might have been ham radio operators, people that might have you know worked with large computers were all gathered together to share, discuss their latest little projects. It was very exciting. And there was not a month that would go by where some breakthrough didn't happen. And then the first magazine came along which was Byte magazine to communicate on a national scale with all these hobbyists. So that it was a very, very exciting dynamic time.

Interviewer: What did you think when you saw the Apple I? Yeah when you first saw that Woz was building that board.

Steve Jobs: Well it didn't quite work that way actually. What happened was that Woz and I had known each other since I was about 12 or 13 years old. And we built, our first project together was we built these little blue boxes to make free telephone calls. And we had the best blue box in the world. It was this all digital blue box. I don't think it works anymore. But we had, we had a fun time doing that. So when it came to building a computer together Woz focused mostly, Woz was the brilliant hardware engineer and focused on the core design of the computer. And I was worrying about which parts we ought to use and how we were going to build these things and how it sort of, and somebody that wasn't a Woz was going to manage to buy all the extra parts you still needed to buy and plug this thing together because you still needed to buy your own keyboard, your own display, and your own power supply. And so you needed to be pretty much of a hardware hobbyist.

Now we made the, a very important decision was to not offer our computers a kit. Even though you needed to buy these extra parts. The main computer board itself came fully assembled. We were the first company in the world to do that. Everybody else was offering their little computers a kit. And what that meant was there was maybe an order of magnitude of more people who could actually buy our computer and use it than if they had

to build it themselves. And the Apple II was actually the first computer to come fully assembled where you didn't have to do anything. And the reason there was it was our observation that for every hardware hobbyist, someone who could either build the kit themselves or at least find these five or ten extra parts they needed, there were a thousand potential software hobbyists. And if they didn't have to do anything with the hardware except use it, make... that meant write their own programs. Still there was a much larger group of people that could take advantage of this. So we wanted to reach them. That was the real breakthrough of the Apple II.

Interviewer: Contrast if you will the Atlantic City fair with the West Coast computer firm.

Steve Jobs: Well the Atlantic City computer show was the first... the first face to face gathering of personal computer hobbyists from all around the country was the show put on in Atlantic City in 1976. And it was in the basement of some dingy hotel. And it just happened to be about 300 degrees outside. So the basement, it was like a steambath. And it was impossible to be down there for longer than a half an hour without being completely drenched. And nevertheless there were a few hundred hobbyists completely drenched walking around for hours. And we had a little tiny booth there. There was a table tablecloth over a hotel table. And there were, Woz and I and a friend or two of our went there and we had our few Apple Is there and a little poster we made. And that was really our first computer show in the world.

A year later, I think maybe even nine months later, there was the first West coast computer fair which was a much more professional operation by, in comparison with Atlantic City. But still very every hobby oriented compared with what goes on today. And that was in San Francisco and there were maybe a hundred companies showing their wares. And it was attended by maybe a thousand people which was a lot for our industry at that time. 13,000, wow, really. 13,000 people. That's a lot.

Interviewer: Jim Warren told me that.

Steve Jobs: That's a lot. I...I'd be surprised at that. But maybe he knows better than I do. 6,000. Thousands of people. And that's when we introduced the Apple II. And I think the Apple II is probably the hit of the show at that time.

Interviewer: In between you went and found McKenna and Markkulla?

Steve Jobs: Well we found Regis by — I used to like Intel's advertising. So I called him up one day and I said who does your advertising? And he said Regis McKenna. And I said

what's Regis McKenna? He said no it's a person. He gave me his phone number and I called Regis up. He told us to go away about four or five times, but eventually he agreed to help us out. And then Mike Markkula I found from a venture capitalist actually, told me that I should go talk to Mike Markkula. Now we hooked up with Mike just around the time we introduced the Apple II. Maybe a month before. But the Apple II was pretty much designed and ready to go. And then Mike came on board and things really started to take off.

Interviewer: How important was the disk drive in the development of Apple?

Steve Jobs: Disk drive was crucial. One of the things that people forget when they think about...about Apple and the Apple II in particular was that we were the first company to come out with a reliable, inexpensive floppy disk drive. And we had a low cost floppy disk drive that really worked about two to three years before any of our competitors. And that was an incredibly important reason why the Apple II was successful. A matter of fact, there were a few others. The Apple II could hold up to 48 kilobytes of memory which today doesn't seem like much, but at that time was maybe three times as much as its competitors. And that's why Visicalc was written for the Apple II. It was the only computer that could hold it. And so if Visicalc had been written for some other computer you'd be interviewing somebody else right now. And it was because of that design decision and other design decisions like it that the Apple II really beat its competition.

Interviewer: How did the Apple II change the world of computing?

Steve Jobs: Well the Apple II was the world's first successful personal computer. And really defined the personal computer as we know it today. So I think it changed the world a lot from that point of view.

Interviewer: One of the theses is that.... well let me turn this question around. How important is market research? How much did you rely on it in the early days?

Steve Jobs: Well I think in the early days it was very easy because you would go to a home group computer club meeting and there was your whole market and so you could find out what they thought. Now if you show them your product and see what they thought and you could because products were much simpler then and within a few months you could change it all around and come back and show the new one.

But as the market got more sophisticated it was less easy to do that. And the problem is that market research can tell you what your customers think of something you show them. Or it can tell you what your customers want as an incremental improvement on what you have

but very rarely can your customers predict something that they don't even quite know they want yet. As an example no market research could have led to the development of the Macintosh or the personal computer in the first place. So there are these sort of non-incremental jumps that need to take place where it's very difficult for market research to really contribute much in the early phases of thinking about how to — you know what those should be. However once you have made that jump possibly before the products on the market or even after is a great time to go check your instincts with the marketplace and verify that you're on the right track. And usually when you show people something they'll say oh my God this is fantastic. Or give you some feedback along those lines.

Interviewer: How has the personal computer changed society? I mean how have we fundamentally changed the way we do our daily business, our daily lives? How's it affected that?

Steve Jobs: I'm not the right person to ask. Ask Al.

Interviewer: We have just about covered, the only other thought I have is when you were getting started out, I read somewhere that you had no intention of building a company. You were just out to do stuff for yourself. Can you give me - I don't know the question asked to get that but —

Steve Jobs: Well, at the time we started Apple, Woz was working for Hewlett-Packard, I was working for Atari, actually for Nolan Bushnell, designing video games. And we went to Atari and showed him our early prototypes and we went to HP. And we encouraged each company to hire the other one and let us do this for them. And we got turned down in both places, probably for good reasons. But we started the company because it was the only alternative left, not because we wanted to.

Interviewer: When did you ever think that this was really going to happen. This was going to go from just an interesting idea that ...

Steve Jobs: Oh it didn't take very long. It happened for me when I saw people that could never possibly design a computer, could never possibly build a hardware kit. Could never possibly assemble their own keyboards and monitors. Could never even write their own software using these things, then you knew something very big was going to happen. When we got into that stage where we were high enough on the food chain if you will that a lot of people could use these things and they were really liking it.

Interviewer: What's the goal of the NeXT factory? Why is it so automated? Why is

that necessary?

Steve Jobs: One could go on for a long time about how the US has forgotten about manufacturing which has certainly been true but we're starting to wake up. And what we're finding is that time to market is very important and quality is very important and the way we can make tremendous increase in quality and reductions in time to market is through automation. So the automation isn't there to lower the cost although it does do that, it's really there to increase the quality and decrease the time it takes us to get our new product, as an example, to market which is very important in a technology based marketplace.

So we happen to be the lowest cost producer in the world already at **NeXT** of our class of products. We also happen to be one of the highest quality producers of our type of product in the world. And we think for a company to survive much less prosper in the nineties that these are going to be very very important things to be world class at. We're not competing at the home group computer society anymore, we're competing with Europe Inc. and Japan Inc. and IBM Inc. and in order to do that we really have to be world class manufacturers.

Interviewer: What if computer networks offered education?

Steve Jobs: Well education been on computer networks for longer than almost anyone else. The Department of Defense has an office called DARPA and they funded a thing called ah ARPANET many many years ago to try to build a command and control network for military purposes. And they did a very brilliant thing. After they got a prototype working they gave it to the university community in America and said bang on this for awhile and see if it works and help us make it better. And after a few years of the university community doing that they created a separate version for military purposes but they left the educational version going. And that is tied together the research community of the United States now for about a decade. And it's vital to the functioning of higher education in this country.

So higher education has actually led the way. That's why we started off focusing exclusively on higher education because where else could you find five thousand people on a network but Carnegie Mellon University as an example. So higher education has been five years ahead of business in using computers in some of these powerful new ways which we're going to see now ripple into business in the first half of the nineties. It's pretty exciting.

Interviewer: How about lower education? How about school? How about lower

Steve Jobs: So far computer used in K-12 has been primarily Apple IIs. And I wish, I wish that they'd been upgrading the MacIntosh as faster than they have been but I think that's

slowly happening and IBM is getting in there as well. The primary purpose of computing in K-12 has been just computer literacy and there's been a bottleneck because there hasn't been enough sophisticated courseware written and that's a problem for our society in general amongst all the other problems with our K-12 education system. One could talk about that for a few days easily.

Interviewer: Going back to the Mac and meeting the deadline for the Mac how crazy did it get? I mean you had already said that you were going to have this big scratch at the Super Bowl.

Steve Jos: Actually we wanted to get the Mac out a year before we did, so we had internal deadlines that we were not able to meet but by the time we set — by the time we bought the spots for the Super Bowl and things like that it was basically in the bag. It's not that we didn't work twenty four hours a day for the last six months to get it out but we were on the bomb run at that time.

Interviewer: I love this, I don't want to call it — this thing that you did was just have everybody sign the cases, that was great. Why did you do that?

Steve Jobs: Because the people that worked on it consider themselves and I certainly consider them artists. These are the people that under different circumstances would be painters and poets but because of that time that we live in this new medium has appeared in which to express oneself to one's fellow species and that's a medium of computing. And so a lot of people that would have been artists and scientists have gone into this field to express their feeling and so it seemed like the right thing to do.

Interviewer: What was it like when you announced at the shareholders meeting?

Steve Jobs: Oh wow it was - well I got the first few rows had all the people that worked on the Mac. About a hundred people. A hundred fifty people that really made it happen were all seated in the first few rows and when it was introduced, after we went through it all and had the computer speak to people itself and things like that, the whole auditorium of that twenty five hundred people gave it a standing ovation and the whole first few rows of Mac folks were all just crying. All of us were just I was biting my tongue very hard because I had a little bit more to do. But it was a very very emotional moment because it was no longer ours. From that day forward it was no longer ours. We couldn't change it. If we had a good idea the following day it was too late. It belonged to the world at that point in time.

I should probably get going.

Interviewer: Yeah, I am just thinking a couple. But let's do the kickers then. Okay, these are the 15 seconds, the beginning of the show to grab people's attention. So program three, we're going from semiconductors to the growth and the establishment of the computer industry. So what did you accomplish? What did you set out to do and what did you do?

Steve Jobs: Well I think maybe it's something different along the lines of what you want to say..... . You know the semiconductor people didn't know what they had in the micro-processor for two to three years. It was the computer hobbies that really got the idea to make this into a computer rather than a calculator.

Interviewer: Would you like to build a company or change the world?

Steve Jobs: When we started Apple we were out to build computers for our friends. That was all, no idea of a company.

Interviewer: How important is a user interface in the design of a computer?

Steve Jobs: Well, the whole idea of the Macintosh was a computer for people who want to use a computer rather than learn how to use a computer.

Interviewer: One way we've been playing with it is it's not how it does it but what it does. In other words I don't care how it does it anymore, I just want it to do what I want it to do.

Steve Jobs: Right. There is a quote in interview that was done with me in Playboy a while ago. I gave a Macintosh to a young kid one time. It was actually Sean Lennon at his birthday. And he had a great quote, he said, everyone else - and I guess I said this actually —

Interviewer: I think this is the older people and the younger people.

Steve Jobs: Yeah, right, the older people all want to know how it does what it does but the young people just want to know what it can do.

Interviewer: Okay, wrap that up in two -the graphical interface, the trend, the line that we're going, how about this - where are we in the evolution of the user interface? And where are we going?

Steve Jobs: The whole discussion about user interface is just strange to me because to me

it's just sort of a natural thing that had to happen and did happen and it's happened. It's kind of like automatic transmissions. Not quite the same as that but...

Interviewer: Okay, networking. Why is networking important? Why is it the future?

Steve Jobs: Well in the nineties we're going revolutionize human to human communication using these desktop computers in the same way that spreadsheets revolutionized financial modeling and the desktop publishing revolutionized publishing.

Interviewer: Great.

Steve Jobs: Okay, good.

Interviewer: Anything we haven't covered?

Steve Jobs: No, I got to go.

Interviewer: This is great. Thank you very much.