CEO Speaker Series
Under the Hood at Cisco: Technology and Culture
John Morgridge
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Speakers: Steve Lubrano, John P. Morgridge, and Hans Brechbühl

SL: Thank you all for coming. It is good to see you all. As I was preparing for today my thoughts were interrupted by an email from a student. He was complaining about the volume of email traffic with a wish that we could limit email communication only to very important issues. As I pondered my response and thought about our speaker today, my mind traveled back to Stanford University in 1980 when two employees of the university had a very different problem. We will call them Sandra and Leonard and they were in love. Though their offices were 500 yards apart from each other, their love was stifled. They wanted to use the university email system to send love letters back and forth. For them it was a very important issue. But there was no way to do that. So they created a way, a way to communicate their affections—it was a router. It connected their two email systems. Love flourished. Cisco was born.

Now I only see some of the email traffic that students share among themselves at Tuck. But having witnessed some of that, I have great hopes for all of you now having heard this story also. The idea of Cisco took hold. Their house became company headquarters for marketing, purchasing, and ordering. At some point they realized that they had a good idea for a company and that they should start to think and act like a real company. So they took their idea to 76 venture capitalists—76—and were rejected by all of them. Remember that as you start to prepare for your internship. The 77th venture capitalist accepted the proposal. He became chairperson and hired John Morgridge to be his president and CEO. Mr. Morgridge is now the chairman of the board and is here with us today as a guest of the William F. Achtmeyer Center for Global Leadership and the Glassmeyer/McNamee Center for Digital Strategies.

During the late 1980's as President and CEO, Mr. Morgridge built a management team that would grow this company from $5 million in sales with 34 employees to over a billion dollars in sales and over 25,000 employees. It is a company that repeatedly wins awards for technical leadership, marketing, corporate citizenship, and every functional area of business.

Cisco and Tuck have a very strong relationship with two cases authored by Professor's Govindarajan and Trimble and as a co-sponsor of the CIO Thought Leadership Summit, this year scheduled for February 17 in Dallas.

For the next 90 minutes, until 4:15, we have the opportunity to share in Mr. Morgridge's wisdom, his vision, and his experiences with Cisco. There will be a chance for questions following his remarks. I welcome you to Tuck and ask you all to welcome him on behalf of the school. Thank you.

JM: It is a delight to be here. I really enjoy this snow. It is kind of a quaint thing. I'm sure that it probably is one of the factors that makes this an outstanding school. You know, there is a correlation with severe weather and good learning. If you look at the K-12 statistics across the United States, the states that fare the best are those that are the furthest north. It probably speaks to the fact that if you don't ski and you are allergic to the cold you can only stay inside and study. I'm sure that is one of the reasons that Tuck is both here and has done so well as an educational institution. I'm delighted to be here. I love snow—both indoors and outdoors.

I want to tell you a little bit about Cisco's history, a little bit about some of our colossal thinking in terms of our focus and growth, a little bit about our culture, and a little bit about how we in our relatively short history of some 15 years dealt with adversity, specifically the bubble that burst a couple of years ago.

We actually had our incubation as was described at a great university and indeed the story is at least partially true because both of the founders, one in particular,

had really adverse reaction to personal contact, in a physical sense. She really did most of her communications, even at the company, through email. I don't know that she originated the term "the flaming email" but certainly she authored her share of them. The love notes, I don't remember. There may have been some but they didn't come to me.

But we had our founding at Stanford. This country is blessed with these kinds of institutions. Institutions that both provide broad based general education and research. It is an important combination because only in that environment can you really find in this country what I refer to as "cheap scientific labor." Undergraduates and graduate students are the inexpensive engines of research. I hope that we never deprive ourselves of that wonderful resource that is in large measure funded by our federal government.

The challenge was, indeed, the challenge of a diverse network. I don't know about this particular institution, but in general alumni have a tendency to donate products of their company's to their alma maters. Perhaps, more often when the products don't quite work right. Then they really like to donate. So Stanford, as Tuck I'm sure, was the recipient of a lot of different, at that time, colored computers. You know, we had the dark blue, we had the light blue, and we had the brown. Of course, none of them spoke the same protocol or language. So they couldn't communicate with each other. It was that challenge that our founders addressed at Stanford and solved in the form of a multi-protocol router. It was because universities tend to be in the forefront of research that we actually incubated in an environment that would become the general environment less than a half a decade later. So when that environment came to corporate America, guess what, we had a solution for that challenge. We had developed it at a university.

These are our founders, Len and Sandy. They were indeed lovers at Stanford and founded the company. Actually, in good university style, they actually founded

and operated the company at the university. It was kind of a stealth corporation, so to speak. It was only after the management of the university found out that they were running the business there that they were asked to leave the campus. Sandy was actually the head of the computer department in the business school and Len had a broader-based job for the university. So they left. They departed on a Friday. I think all they took was one reel of tape. I think that was all they departed with.

On Monday, after working a long weekend they had products available for sale in their new company. Their new company was initially situated in Atherton, California. Still, a stealth company because Atherton being a high upscale residential community does not permit any commercial activity within its boundaries. As you can see, if at some future date the town father's decide to memorialize Cisco the way HP has been memorialized in Palo Alto it won't be some crummy one-car garage. They are going to have to upgrade. But this was a great location because it had a circular driveway so FedEx trucks could pull right in.

Like many companies in Silicon Valley, this was indeed a "phoenix" company. By that I mean, it came up out of the ashes of the dead and died which is one of the reasons that that soil there is so fertile because we have a lot of failures. When you have a lot of failures, you have a lot of new enriched ground on which to build a new kind. Cisco certainly was that. Our company was built on DEC-20s. We used DEC-20s as our engineering machines. Fortunately, it was a three-car garage so they could easily accommodate the DEC-20 in the garage. It was at that time, of course, that Deck had already buried the DEC-20. We used some free engineering software called SUDS from Stanford as our engineering software. So very typical of start-up companies of that era. Now with venture capital, a lot of them are different. But this was one a company that started out on credit cards and a second mortgage—that is where Cisco came from. It was only

very late in its history when it was already profitable that it got venture money, and then only one round of venture money in 1986.

Cisco is actually a contraction of Francisco. That is why the company's name was spelled with a small "c" to start. I don't know if you have ever done any research into how companies get their names but they are named after all sorts of crazy things. Cisco actually has some basis in the sense that, you will notice that we use a bridge for our symbol. The bridge is the Golden Gateway—the San Francisco Golden Gate bridge. It is called the Gateway and early routers were called Gateways. So it seemed like a logical symbol for the company.

So we started at Stanford in 1984 undercover. We shipped our first router in 1986. Actually they did production at home in the living room. The manufacturing was in the living room and engineering was one of the bedrooms. They, of course, had IT in the garage. So it was kind of a family business to start. We did our IPO in 1990. Our volumes were about $60 million when we went public. If you bought our shares then you would have paid the equivalent of $.06 a share. We have had numerous splits. Actually, I think we split the stock every year that Buffalo played in the Super Bowl and lost. I don't know if that was a deciding factor but it worked out that way. And they played in the Super Bowl I think four or five years in a row.

Like all companies, we started with a router and then went with natural extensions of the line—the small router and the large router. Now you may sigh and say, "That is not too creative." But you know it is very hard to make a small router. Engineers love to build things bigger and better. They do not like to take a product down market. It is very challenging to take a product down market. Because what they try and do is give you the same thing at the lower price. That is not really what you want. What you want is for them to construct something totally different.

Since then of course, we have expanded. We have expanded by viewing our world as a landscape—an ecosystem, if you will—and then looking at the pieces and parts in that ecosystem and slowly building it out either through acquisitions, which I will show you in a minute, or through our own product development. The thing that John Chambers did perhaps best for this company, one of the major things he has done, is to keep evolving the vision of who we are. Certainly one of the big steps that he took, well there were a number of early steps, was into switches. We started out as a router company. A router has a lot of intelligence in it and a lot of software in it. Switches are far less intelligent. They are kind one level down from a router. Somewhere between what was then known as a dumb hub. So that was kind of a natural evolution. But this idea of end-to-end solutions—providing all of the equipment—this whole idea of becoming a partner with your customers, becoming a trusted partner, becoming a consultant part of it—all of those are concepts that he has evolved over the last seven years that have really kept pushing the envelope for the company.

We are now 35,000 employees. This past year, we did $18.9 billion in revenue. We have expanded quite extensively in terms of some of the new products. I will talk about those in a minute. Some of the key priorities just looking at customer focus, technology leadership, of course mandatory in our space, financial strength, the internet ecosystem which undergirds our whole business model. Our business model is predicated on a very networked environment—both internally and externally—and empowering employees, and we will talk a little bit about that. And then the step from just being a supplier to becoming a consultant, providing consulting with your customers as they address their business problems.

We have three major market segments. Our initial was the so-called enterprise, the Fortune 1000, the big institutions of the world. Since then we have entered two other markets. One is service providers, who actually own the networks and equipment and provide the services to the enterprises. Second, small and medium size businesses. So these are the major focuses of the company. As I

said, the company basically started out with routers but you can see now we have very strong position in switches, optical, security, wireless, voice over IP, all kinds of access, fiber optics capabilities, all of these and now most recently even storage, content management. We spend a very high percentage of our revenue on R&D—about 15%--and actually that year it was closer to 17% because we took such a hit the prior year in terms of revenue.

Some of the new products that we are looking at—some of which you are using here on this campus—include wireless capability, security, and management. These have all been major focuses for our company over the last three years. We basically never leave market spaces that are at least a $1 billion business at the end of three to five years. If they aren't a $1 billion business, they aren't exciting to us. So they have to be at least a $1 billion business. We hope to have a dozen of these new product areas that we are focusing on. Not all of which will be successful but some of those clearly will. Wireless clearly will be one. I think that content and storage can be, although we are a very small player in that space currently.

Now there are three ways that we develop technologies, products, and services. We do it internally on our own engineering budget. We do it in partnership with others. And we do it by acquiring.

Acquisitions, in effect, are the only way that you can buy time. The most valuable asset a research company has is time. There is only way to buy time and that is to buy someone who started earlier. When you have a very broad landscape of possibilities you either place a huge number of bets or you acquire. So we have been an aggressive acquirer. These are the criteria that we typically use to select who we are going to acquire. The bottom one, I think, needs a little bit of explanation in the sense that one would assume that in a highly networked environment location wouldn't matter. But the problem you run into is that there are only a certain number of people who want to live in Akron, Ohio. If they live

in Akron, Ohio they typically do not want to move out of Akron, Ohio. The other phenomenon is if they don't live in Akron, Ohio they don't want to move to Akron, Ohio. So in order to try and expand a business in a space like Akron, Ohio it is very hard to get your people to move in and it is harder to get those people to move out. So what we have instead is some major campuses around the world. Although really the only large campus outside of the United States for research and development at the very basic level is in Israel. But we have them in San Jose, California of course. We have them down in Plato, Texas. We have them in the Boston area. We have a few others. There is one up in Ontario. But what we do is acquire principally in those areas and then consolidate them into those facilities. In other words, to make them a part of Cisco.

One of the reasons that we think we have been successful in our acquisitions—as you can see we have done a few of them—is that we very quickly convert them into our structure. From day one they are on our network facilities. They are on our voicemail. Immediately we make them part of the company. We don't run them separately. There is only exception to that and that is our acquisition of Linksys where in effect they have a different business model and it is our intent really to stay away from them rather than get close to them. We are afraid that they will lose their business model to ours. We will dominate it if they are too closely aligned.

I would say that our success with acquisitions is probably at the same level as a typical venture capitalist. That is that 10% of the acquisitions really pay for the whole show—10% to 15%. This means that they have to do very well. Some of these starting with Crescendo which was our first acquisition and that is probably a $6 billion business for us. So you get a couple of those and they can take care of the other 70 that didn't work out so well. We have to do better than a venture capitalist because all a venture capitalist has to do is take it to harvest. They either sell it to someone or take it public and then he or she is out of it. We have to live with it and make it viable over a long period of time or it doesn't pay off.

You know how you can tell a successful acquisition, you can tell a successful acquisition when you can go back three years later and find the same team of engineers working together to develop products for you. You are buying not only time but you are also buying the relationships that they have established. Just hiring that number of people doesn't give you the same capability. You have to have a team that you are hiring. Not people, but a team. So the productivity and the return really comes by keeping that team together and having them. Some of them, particularly Crescendo, Crescendo really put a stamp on us. We bought that company for $100 million. We bought it when they had revenue of just $10 million. If you look at the people that we acquired, there are at least six that report to John Chambers. Six people out of that group report to John Chambers.

Two other benefits from acquisitions. These are subtle benefits. One is that if you acquire successfully you enforce and reflect the ability for a company to change. Most companies have a very strong immune system. They reject and kill any invaders. If you have a culture and a system that can tolerate that kind of infusion, then you have a culture that will tolerate change. The second thing that happens is that it forces in new talent. You are basically buying engineers. You are paying $6 million a piece for them in some of our acquisitions, for engineers. So you are buying people. But if you do a good job you are forcing new talent into the company all of the time. You are forcing it in. You know, most companies are very comfortable with the old team. If you are a growing company, you need a new team. Not just at the entry level but all the way up through the pyramid. Acquisitions provide the opportunity to do that. It is really a refreshing capability for your management at all levels in the company.

Financial strengths. I apologize for this chart because it doesn't go through 2002 which is an interesting year because it is a down year. Maybe that is why we didn't put it on the chart. But it was a down year. We did about $18 - $19 billion in 2002 and 2003. This is quite old because we are now in 2004. Our year runs

August to July every year. We experienced a major downturn and I will talk a little bit about it. There are three things that influence valuation of companies. One is revenue growth. We have learned that because we are MBAs. Second is growth of profitability. What is the third factor?

OS: I'm just a reporter.

JM: Are you an MBA?

OS: No.

JM: Are there any MBAs here? What is the third factor?

??: Risk?

JM: No.

??: How the industry is doing.

JM: No.

??: Consistency.

JM: Consistency! Consistency is the third factor. You look at anyone that gets good valuations and it is consistency. I don't care. You can have this kind of profitability and this kind of growth, but if you have an up quarter and a down quarter and an up quarter and a blow up quarter and a collapse quarter then guess what? You don't get a high multiple. High multiples are predicated on growth of revenue, growth of profitability, and consistency. People do not like to be surprised. They like a nice consistent path because to them it says that there is underlying value in this institution/organization. So once you break it then you have to reestablish that credibility in the marketplace.

We, incidentally, have most of the valuation in our industry. Our valuation today is about $200 billion. We probably represent 70%-80% of the total valuation in the industry space depending on how you specify it. I would specify it so we would have maybe 90% of it. They would probably set it at a little lower.

We are an internet company. The internet has permitted us to be a partnering company. I worked for a multinational called Honeywell and I was part of their computer business. They went in to the computer business in 1958 and exited it about 1980 something. But the interesting thing about that company was that we had a lot of competitors—people like IBM, Sperry, Rand, RCA. But you know who the worst competitors were? The division in Phoenix. The division in Italy. The division in France. Those were the real animals and we knew that. We knew that they were trying to steal our business in Waltham.

Partnering is very difficult. Not only in corporations but particularly when you go outside. There is a term called "Coopitition." Now what this says is that you are simultaneously a supplier to, a customer of, a competitor of, and a partner with another company. That is a very hard set of mentalities to develop in a culture and maintain in a culture. But it is often fundamental to partner. Because there are almost none of these partners up on this list with whom we don't compete. So you have to develop a mentality within the culture of the company that tolerates this kind of imbalance, if you will. Partnering only works, well its like politics, all politics is local. Good partnering is all local. It doesn't matter that the two presidents stand and shake hands if down in Boston they are competing against each other and aren't cooperating. All of this of course is now possible because of the internet. We probably couldn't have this kind of structure and mindset. Without it quite frankly, you probably can't be successful in this space without it. So it works both ways.

I wanted to talk a little bit about how we have used the internet and networking internally. These are our 2003 results and our estimates of the productivity gains in dollars that we have gotten from our networking capabilities. A bit over $2 billion on revenue of about $19 this past year. They come from all different sorts of things, some of which you would probably recognize right off. But I think the key to it is the use of the network with all of your constituencies. That is where

you really get the leverage out of it. Where you can leverage particularly the same data and same information slightly modified in a lot of different venues.

We started, strangely enough, not with marketing and not with sales but with service and support. We did it because if you have ever called your PC service line what you generally get most of is a long wait. That is kind of what you normally get. So we decided very early on that we couldn't hire enough nerds to manage the phones. So we went out and we said, "We have got to have an online solution." So we spent a lot of money. We started in the early 1990's developing a service capability that was provided online. So now, today, probably 95% of our service is provided online 24x7 around the world. It doesn't vary. I mean you get the same thing if you are in Beijing, China as you do in San Jose, California. We take in over 95% of our orders online. So that is where those big savings have occurred. They are basically support people who we don't have because we provide the support in a network fashion. So this is what you could do, and it shows you a little bit about the magnitude of the savings.

You know I often ask new employees, "Give me a word that describes Cisco to you?" One of the words that is often given is the "web." Everything is on the web. No matter what you want to do it is on the web and that is where you go to get it done. These are some of the things that are on the web for our employees. We have three auditors that do expense accounts for 27,000 employees. You enter all of your own data and it is approved electronically. If it is approved it is automatically transferred to your bank account. You know, I can remember doing a study when I was still president of relocating accounting and finance to a cheaper location. Larry Carter, our then CFO, said, "We aren't going to do that. We aren't going to hire. We are going to solve the problem in a different way." To a large degree we have done it in this area.

A strange thing like patent applications in the legal department, all patent applications are now done online. Engineer puts it up in a standard format, get's

peer review online, if it is approved by the peer review then it is electronically transmitted to an offsite lawyer who makes the application. It had a huge impact on the number of patent applications.

So you can actually come up with all kinds. We do 360's now at all levels in our company so everyone gets a 360 once a year. It's done online. There are a specific set of questions and goals.

E-learning. All of our learning and training is now done online. I don't know what the attention span is. I haven't taught here at Dartmouth. But the attention span of our employees is 15 minutes or less. So all of our training is in 15 minute bytes. We can't hold their attention any longer than that. They seem to drift off somewhere else. So all of our training gets done. But we do a huge amount of training on marketplaces, new products, and competitors. All of that is all online material—nothing is published. It is created online and then dispensed in a lot of different ways. We use it, of course, with our partners for their training.

Supply chain management. You can see what we estimate our savings to be there. They can always tell when Cisco arrives because the first thing they do is go in the conference room and put down their lap top computers and open them up and log in whenever we meet. We actually have factory managers for factories that we don't own. We do it online. We have a lot of test equipment that we own (and some of it that we don't own) that is online so that we know how they are doing with their product set.

We have a goal of increasing our revenue per employee. It was I think as high as between $700k - $800k. Historically it has been as low and maybe even less than half of that. But we have a goal of $700-$850k and then a million per employee. That is kind of the goal that we have set for ourselves.

Culture. Certainly one of the reasons that you came to Dartmouth or to the Tuck School is what? Culture. What is the culture here? Describe the culture here.

??: Friendly.

??: Teamwork.

JM: Small. Intimate. Not too competitive. Teamwork oriented. That is the culture. Now do you think that just happened or do you think they created that? Did they work at trying to build that culture and maintain that culture here? Cultures happen irrespective of whether or not you put any focus on them and they are hard to influence. Particularly, if you come into an established culture and you want to change it. But when you go out to look for a job, one of the key things that you ought to evaluate is culture. How do you find out what a culture is like? You are going to interview for a job and you decide maybe you are interested in this company how do you find out about the culture?

??: Talk to people who work there.

JM: Absolutely. People who have left. You network to find out what that culture is like. You ask them to describe what the culture is. What are the attributes of the culture? We actually did a culture decision at Cisco. We evaluated various cultures. The interesting thing you find out is that there are a lot of cultures that work in businesses and institutions. There is only one problem, you might not want to be in that culture. They work but they aren't very pleasant. So we actually went out to create a culture. Now some of the culture is a reflection of the personalities of the founder. Who founds company? What cultures come with the founders? Who is the first there?

??: Entrepreneur.

JM: Ok, who else?

??: Innovator.

JM: Ok, but what group of people?

??: Engineers.

JM: Engineers! Engineers come first. So they have the initial capability. They and the founders have the initial capability in setting the culture. Do we eat pizza or spaghetti? Do we drink beer or wine? Is it Dr. Pepper or Pepsi-Cola? They influence all of those initial decisions. Once they institutionalize them it is very hard to change. Now you should know that I think you can very seldom miss with pizza. It is almost a slam dunk in an engineering company that pizza will work. You don't have to worry about it. It scales reasonably well. At Stratus, when we chose a new location we actually had to do a survey because we needed 1000 pizzas once a month. Now that is a big number! We actually had to do a survey of the area in Boston and greater Boston of how many pizza shops are there and can we get 1000 pizzas delivered all at once. Now this is a big task. Particularly if you give choice—do you want anchovies?

One thing you have to be careful about with culture is that what is cute and quaint when you are small may not scale. Beer every Friday is a great idea when you are 100 employees. It is not such a great idea when you are 10,000 employees. So you ought to think about it because it is very hard to change culture. Now in our own company we had free soda pop and free fruit juices—because health was an issue. "We don't want to just drink sugar. We want some sort of health benefit from it." Then of course water came in and the first thing you know you have 70 different varieties. We were a Dr. Pepper company because the engineers liked it and then Diet Dr. Pepper then non-whatever Dr. Pepper. Then of course someone else came in and you have all of these.

We spend about $400 per person a quarter for refreshments. They are all free. That is not too big a number when you have 65% margins and you are 1000 people. That gets to be a bigger number when you are 35,000 people. So we tried to cut back. You know, maybe drop guava juice or mango juice, which wasn't a big seller. What you find out is that people develop dependencies. While it may seem a small thing to you it is a big thing to them. They would say, "Why is it that a big profitable company like this is taking away our mango juice?" They shut the company down. Fortunately, I in my greater wisdom overruled the facilities manager and reestablished that we would keep mango juice. Then we tried to cut back at the remote locations. Pretty soon there would be emails, "Why is it that the North Carolina facility does not get Snapple drinks? Are we second class?" So all I am saying is that what ever you do think of it in the broader sense.

Culture takes a lot of time to develop and you have to work at it continuously and you have to reinforce it. There are all kinds of techniques as to how you build culture and how you use culture. One of the ones that I'm most proud of is giving back. We have a very strong culture at our company of giving back. Giving back to our community, whether you are a community citizen in Boston, Massachusetts or San Jose, California. You know a lot of companies are good community citizens at the headquarters location, but you can't find them anywhere else. We have made a real effort. You involve your employees. I will show you in a minute what I think is a good approach.

Internet and education are two of the important things in our lives. Educated minds are our major resource. We spend a lot of time in terms of looking for good minds and training good minds. So we value education. It is after all the basis of our company. Now there are a lot of different ways that you can give back. Normally people write checks. But that is the least of what you can give back. You can give back products, certainly. You can give back your knowledge.

You can give back your human capital. You can give back your geographic capability. There are a whole series of things and assets that companies have that they can give back.

Now I don't know but some of you may have seen the article by Porter on Corporate Philanthropy, and this idea of aligning the pure business goal with the pure philanthropy goal. The reason you want to do that is it provides a sustainable kind of giving back. It is not a one kind of thing it is a sustainable capability on the part of the company to give back. He cites us as perhaps the glowing example of hitting the sweet spot between commercial and social economic benefit. The examples are the Cisco Networking Academies, a thing we launched six years ago in 1997. This is a curriculum taught initially as an elective to juniors and seniors in high school that trains them on the fundamentals of networking—how to design, install, and maintain networks. Today, we have 10,000 institutions teaching the curriculum all over the world. 152 countries. Some 10,000 institutions. We have about a half million students enrolled. We have trained some 25,000 instructors. We do a lot of testing in this. It is a very integrated curriculum. It is delivered online in what we call "blended environments." So there is an instructor in the classroom but all the material is delivered off a networked PC. They are tested every five sessions. We have a mantra, "Test to master. Not to measure." In other words, we are interested in what you don't know so that we can force you to go back and master it so that you can pass the material. The first four semesters of it have been translated into nine different languages. We actually have kids here in this country taking it in Spanish. We are all over the world. You can see all of the yellow countries. You can see the numbers and the various parts. The United States is a big part of it, not quite half. We have actually developed 16 semesters of curriculum now with things like IT Fundamentals and go all the way to wireless and security modules. There is typically 70 hours of online material.

We have also done some other projects in this space. We have now launched a health academy with the Worldwide Health Organization. We are piloting it in Jordan and Egypt in about 40 high schools. We have really done a lot of work in this area. Now the pay off and the problem with that hitting the sweet spot is that if you are doing pure philanthropy, no one asks you what the economic return is. But if you do philanthropy in conjunction with a business goal then they say, "Ok, what is the business return from all of this philanthropy that you are doing?" So we can say things like, "We have a network academy in 99.6% of the congressional districts in the United States." What does that mean? Well it means that whenever I run in to a rep and he says, "Why don't you put a factory in my area?" I can say, "We are already active in your areas. We are investing in your people. They are our most important resource." So it has been a huge pay off to us.

Partnering. A lot of different partners. The interesting thing about partnering in this space is that you partner with a lot of people that you wouldn't have otherwise. You partner with the UN. You partner with UNDP. You partner with a lot of schools and institutions. You partner with a lot of state, local, national governments in this kind of a program. You have a huge basis of new partners and you come at them not as a sales organization but as a partner to accomplish some kind of a common goal. So it has been a very successful undertaking.

How many of you have worked for a start-up? How many of those start-ups are still in existence? A few. We spawned a huge number of start-ups in the late 1990's and on into the year 2000. Of course, most of those have collapsed. During that period, Cisco not only sold a lot of equipment to those start-ups but also sold a lot of equipment in a new market space called service providers, which has certainly been dominated by a few large communications companies. The Bells here in this country nationalized telephone companies throughout most of the rest of the world. We never were much of a player in that space. Although we sold them a lot of enterprise kind of products, we never sold them much

equipment for their basic factory communications networks. That is about, depending on how you estimate it, a $75 to $100 billion dollar business. Historically dominated by a limited number of companies.

During that build up to the bubble, we invested in that space. But we didn't invest with the old running companies. We invested with new start-up companies. There were about 3000 of them. In a period of six months starting in about December of 2000 through the summer of 2001, that set of companies went from 3000 to about 150. Our revenue volume, which we had projected to be $4 billion to $6 billion a year, went to under a billion. So we had a huge collapse. More importantly, we were growing at a rate of 50% and when you are at $15 billion and growing at 50% a year and you apply that kind of growth statistic to the number of employees you need, the amount of office space you need, the amount of materials you need to order, you come up with very large numbers. So it collapsed. The bubble burst. The bubble. The economic crisis. The corporate ethics crisis. The confidence crisis. You know, you could get money for nothing. It didn't cost you anything. You could come up with an idea. I don't know if it happened here at Tuck but I was teaching at Stanford and they drew a business plan and would go out and get $25 million. The students would say to me, "Hey John, do you want to give me $25 million? I don't know if this is going to work or not but gee what an opportunity." So they took the $25 million. Of course, in a period of less than six months it collapsed. The key goal in that kind of collapse is that you have got to stabilize your customers and restore productivity because our earnings for the year—we actually had a negative year earnings-wise—first in our history. So you have to back and you have to re-reestablish your business, and then you have to struggle to grow to the top line. When you go through that, Chambers came up with six major areas of focus. These were his major areas of focus:

- Profitable business growth: In order words we were no longer investing with no return. No near-term return. We went back and everything had to pay for itself because we wanted to reestablish our business model.

- You have to look at the cost structure. We had a major layoff. It was first and only layoff we have had. We laid off about 8,500 employees, but realize that going into that we were hiring 1,000 employees a quarter. So we were adding a lot of employees.

- Prioritize your resources. In other words, refocus on your businesses.

- Strive for productivity. Don't goof up on productivity. Those projects are still in place.

- Of course, refocus back—and most companies do this—on your core competencies.

- Then build some kind of a foundation, some kind of a future that will allow you to break away.

We went through all of this. Concern, denial, shock, fear, despair, and all of those. We were getting the downward spiral. One of the ways that you reinforce that spiral by the way is by having a layoff every nine months. You don't take it all at once. You lay off every six to nine to twelve months. You go back and you make another cut and another cut and then you make another cut. What you need to do, if you are going to cut, is cut deeply enough when you start. Always underestimate how soon it is going to come back and how vigorously it is going to come back. More layoffs reinforce all of this as you go down. You can look at the companies that did it. All of our competitors did it—Lucent, Nortel—they had layoff after layoff after layoff and every layoff was the last layoff. Well, they didn't even say that after a while. Sun has gone through the same cycle and still

isn't profitable. They are really struggling to try to come back to profitability. These are very difficult times and you have to take very strong actions. Of course, all of this is an outgrowth of that downward spiral. This is what you get out of that downward spiral.

What you need to do to reverse it is make that deep cut, and then refocus. One of the things that you have to do during that time period is over communicate. Top management doesn't close the door and hide. They have to be out there in front. They have to take the questions. They have to see the employees. They have to reinforce.

Then of course, as John did in this case, you have to have new projects. Those new areas that I showed earlier, you have to put some resource into those. You have to get that started from an engineering standpoint—wireless, security. You have to do that investment. You have to get some short term hits so that you have something to celebrate and something that is positive. This company has gone through two years of absolutely flat revenue after 12-15 years of 30% growth or better every year. So a big internal change. I think we have come through it. Certainly if the economy continues to come back even gradually I think we are positioned for it.

That is kind of what I wanted to say. It was probably more than I should have said, but at this point I would be glad to take any questions.

Now one of the things that you do…I learned this from General Clark…We are going to roll up sleeves, take off tie, etc. Many of them do this. Most of them take off their coat. Clark now wears a sweater. I think it is kind of quaint. I didn't know that the military wore sweaters. But it is nice. So you take off the tie. He does it better than I do. Of course, he has had more practice. He probably does it three times a day. Then the really winning move roll up the sleeves. I like this. This says, "I'm here to listen. We are going to solve these problems

together, folks. I don't have all the answers. I'm ready to listen to you folks. Go ahead! Give me those questions!"

??: Having gone through the downturn, maybe in a less dramatic fashion, one of the frustrations at my company with our communications was that you could tell that the management wanted to tell us what was actually going on, but then legal would get hold of the email and it would get twice as long and they would take out all of the real information.

JM: That is the problem with legal. When Valentine, he was the original investor in Cisco. He told me after he had hired me as President he said, "As soon as you hire a lawyer, I'm going off the board." What you want to do to lawyers is you say, "This is what I intend to do." You don't ask them for an opinion. They are not the business manager. You say, "This is what I intend to do." Then you listen to their observations. You may accept some ,depending, or you can say, "I'm going to take the risk. We aren't going to do that. I want it this way. This is how we are putting it out. If we get in to trouble then you defend me."

??: Cisco has recently lost a couple big contracts with service providers just as that market segment is coming back. Juniper is a particular thorn in your side. Do you have any comments? Will you go back to purely the enterprise space?

JM: No. Actually we have done reasonably well in that space. It's a huge market. We have a very small percentage. There is a lot of upside in that. We are in the single digits as a percent of that market. We have won most of the Bells, not Verizon, but we have won BellSouth, we have won SBC. We have done reasonably well there. It has been a difficult comeback for us because we really were mean to them. We were right but we were mean. We said, "Hey guys voice is going to be free. No one is going to pay for that in the future." That is like saying to someone, "All your revenue is going to go away. What are you going to do about it?" We also pushed very hard to go to the digital world from the analog

world. They didn't want to hear that. They wanted a slow transition. Of course, if you are going to do a slow transition then that means that you have got to build much more robust product set because you have to transition them through that. You don't replace it all at once. That made Greenfields attractive. There was no transition. You just put in all new. It was an easier market for us to penetrate. So we really worked hard and have eaten a lot of crow over the last few years to reenter that space. It is a huge market. There are many products within the market. I don't know what we cover but it is probably less than a quarter currently.

The other thing you should know is that healthy companies need strong competitors. If you don't have strong competitors you are going to wither. You become complacent. Our company has been fortunate to have a lot of competitors. Most of them, bless them, are gone. But we had a lot. The initial competitors that I competed against are all gone. The second set of competitors that I competed against—Cabletron, Banyon Networks—they are all gone. They aren't out there anymore.

??: Cabletron is still kicking.

JM: Unfortunately I bought stock in all of our competitors. No, Cabletron is not kicking. Some of its so-called spinoffs are. Do you see DEC around anymore? Those were all of our competitors. Do you see IBM in networking anymore? They were all our competitors in the space. They were good competitors. Most of them were good competitors. One of the reasons I think we have been successful is because we had those competitors. So I think good competitors like Juniper are healthy for an organization. I would hope that we always have competitors because if we don't have new competitors, it says that the business technology has stagnated. That is the worst thing that can happen to us is the stagnation of the technology.

??: You mentioned the importance of being a technological leader. I'm wondering how Cisco is mandating this. On one hand you have competitors such as Dell that are increasingly entering your market and monetizing those products and on the other hand all of that technology is increasingly becoming available to other competitors in companies such as India and China.

JM: Well those are what makes business the greatest game in the world. If you didn't have that it would be boring. It would be boring. I can't imagine being in the hamburger business. I know there have been a few imitations but they are hardly global in scope. Those are the wonderful challenges. The challenge of China and the challenge of India, now those are great new challenges. They will be a real test. Not only for Cisco but for every US corporation because their business model is different. You know most of the people that we have competed against and won have used a very similar business model. Maybe the Chinese and maybe the Indians will be forced to the same business model. I don't know. Certainly they are starting out with a slightly different business model. So it is our ability to both conceive and execute plans that keep us competitive in that environment. We are having a board meeting this week and it is totally focused on China both as a market and as a competitor. Now one of the reasons that we bought Linksys is because Linksys is part of that new model. Just like Dell is part of that new model. Dell doesn't do research it buys research from Asia and incorporates it in a product. Of course some of that research is our research recycled. We develop chips that are made there and then sold as a commodity. Well maybe we don't do that anymore. Maybe we develop our chips on a proprietary basis. Don't let them be commoditized. I don't know what the solutions are but that is the challenge going forward. That is what is wonderful about business, particularly the technology business. There is always something new—new competitor, new technology, new location that you want to be a part of. I don't think there is an answer, as is the case to most major problems.

??: A follow up to the commoditization question. Until not long ago most of the revenue was from boxes and bandwidth cost. Now with commoditization the cost for enterprises is services. People are expensive. Do you plan to enter the market for managing systems, for network management services? Cisco is not doing much in this area. Cisco has been proud just to sell boxes. Is this correct? What is your opinion?

JM: Certainly everyone in our industry has sold boxes. We have taken a step beyond boxes in terms of attempting to work with our customers in developing solutions using our boxes. We have invested a lot both internally in applying the technology so that we have first hand knowledge and we have looked at what other leaders have done, and make that available to others. Now, in terms of managing the software there have been in my short lifetime in this part of the industry (I have only been in the industry since 1987), there have been numerous companies that have attempted to develop management systems. None of them have to my knowledge become successful businesses. I don't understand the phenomenon. Cabletron spent a lot of money in this space. Banyon, Edwards and its predecessor, Synoptics, spent a lot of money in this space. Two phenomenons really, first, it was helpful in selling. But it was marginally applied, and typically fraught with the inability to customize, to meet the specific needs of a customer, which were so varied. Less so today, but if you have got a global structure and you have three or four carriers, and you have all kinds of different storage capabilities, it's very challenging.

We have made a lot of progress in hardware. Software is still at best a kind of structured art—not quite paint by the numbers. Maybe in my lifetime there will be a solution. We have certainly looked at it and have made attempts at it in various forms both through acquisition and through our own development. I would say it remains a real challenge. I don't know that it is unique to us. I mean if you look at most software companies they really struggle with it in terms of new releases, the number of bugs, the ability to manage it, and you are talking

about a lot of nerds when you do that. I don't know. If someone here comes up with the answer bring it to me.

??: You already mentioned that Linksys acquisition was a fairly unusual one for Cisco. Linksys is more of a consumer brand, sort of an Intel type of strategy. Do you plan to change the Linksys brand to Cisco?

JM: I think it is Linksys by Cisco or something of Cisco in the small print. You know you have to be very careful. They have a totally different business model. They spend 1% on R&D. What do we spend? So it is a whole different way of running a business. I think the acquisition was two-fold. Number one it is an important market that we want to be a part of. We have sent probably a half dozen of our people to Linksys as employees because we want to understand how that model works and whether or not you can scale that model. It is a half billion dollar business. Can it be a billion dollar business? Can it be a five billion dollar business? I don't know. Right now, I would say it is more of an exploration. Certainly based on our multiple it has been good news to them. It has paid off for us. Time will tell. Right now we are running it as a stand-alone subsidiary.

??: You emphasized earlier the importance of consistency with earnings and that often implies some…

JM: You mean management? Managing earnings! How many here believe you should manage earnings? Anyone? What is this school that you are going to? What is this school that you are going to? Isn't this a management school? Isn't earnings part of business management? Absolutely. So what you are asking is where are the guidelines? Certainly we all know that you shouldn't ship bricks and take them as revenue—as one company did. Probably you shouldn't ship empty containers without the blades and boards and take revenue. I mean you probably shouldn't do that. But then it becomes more questionable, should I at the end of the quarter give a special sales bonus for people who sell my product?

Is that managing earnings? Worse yet, should I give special discounts to customers in order to make the quarter?

You know these are the things that are part of culture. This is part of learning what the culture is and what is acceptable. But certainly it is incumbent on management to manage earnings. I mean that is what business is all about. Consistency is important. Now I looked at our former competitor, Cabletron, and every quarter they had the same gross margin to the tenth decimal point. They had complete similarity in their numbers--very predictable. As a result they had a multiple twice as high as Synoptics who was a direct competitor who actually produced more profit, but on a more randomized basis and had bigger faster growth. They actually grew faster. Now what was Cabletron doing? Well in the case of Cabletron, they were delivering a total solution which included hardware and software and operational assistance so that at the end of the quarter who made the decision as to whether or not all of that capability was delivered? It wasn't the customer. Now that is managing earnings. That is one way of managing earnings. So you could literally set up a situation where in effect it was at my discretion as to when a contract was complete.

Now there are all shades of what you do. What you want to do is you want to do what is ethical. So that you can print it in the paper and you wouldn't be ashamed of it. That is the test that you apply in your actions. Now does it always happen that way? No it does not because we are 35,000 employees. Our employees are graded on a quarterly basis. They are paid commissions. They are paid bonuses. Do we have rules in place? Absolutely. One of the rules that we have in place as an example is we will not book anything that is deliverable in more than 90 days. It has got to be deliverable in 90 days or we won't book it. It doesn't get credit. That is a control that we put on it.

The former company that I worked for we had backlogs that rolled for years. You would have a huge backlog and you couldn't make the quarter because you

couldn't ship any of it because it wasn't real business. Maybe in someone's dream it is business. That is why they teach ethics and why you have ethics issues in your cases here. I hope! Cases where you have to decide whether or not you would do it. Maybe some of you don't think you should pay spiffs. I don't believe you should pay spiffs because it creates a terrible hockey stick. I don't think you should give bigger discounts at the end of the quarter. One of the reasons that we have such a variable year is that we confuse our customers as to when we are actually closing the quarter. It is a different day every quarter. It is always a Friday but a different one each month. So there are a lot of things that you can do to change patterns and create different cultures. That is what management is all about.

??: How do you view the volatility in this industry? Is it just the nature of the industry? Does that matter?

JM: I kind of answered this question earlier. What you need to do is you have to have checks and balances within the internal structure of the company. There is one thing that you probably don't want. A pessimistic president. Probably not what you want if you are a growth company is a guy that is always saying, "Well this year is going to be worse than last year. I hate to think about next year." Then give you all the reasons why. What you want is someone that says, "We are going to do better. We are going to get better. I believe that. These are the things we are going to do to accomplish that." Then what you want is other people, namely the CFO, to be very pessimistic, very conservative, a show me attitude. You ought to have a board that has oversight, and questions, and says, "Gee, that sounds awfully optimistic." Certainly our businesses don't see that kind of rosy-ness. Maybe more rosy, less rosy, whatever. You have got to have those checks and balances within the structure of the organization to keep it in balance just like any other institution.

Last question.

??: As a successful manager how did you come to the decision to pass over the every day running of the company to a new manager?

JM: A couple reasons. In our industry what usually happens is the management stays long enough to degrade the business so that someone gets the guts to fire them. I mean that is the pattern. I don't know if you have ever run a business in technology but it is a killing job. John Chambers works 7x24. Seven days a week. I will tell you, I didn't want to work that hard. I wasn't prepared to do that. If they carry you out there is usually a one to two year unstable period. It will be interesting to watch Motorola, although that company has been unstable for some time, so maybe it won't happen. But when you have a change and bring in an outsider, I had determined very early on that I wanted to retire before I was 65 and I wanted to find someone to replace me. I'm very proud of the transition. We did not miss a beat. The company continued to grow. The growth accelerated. We became the dominant vendor in the space. Part of it was that instead of staying a couple more years and kind of hanging on I got out of there. I think that is important. At Stanford at the business school they teach you that you should be re-potted every ten years. I'm not saying that everyone should stay ten years or maybe some should stay less but certainly they shouldn't prompt you to stay 20. Now if you are running a public utility, maybe you are right.

Thanks a lot.

HB: John, a very interesting set of business lessons through the eyes of Cisco. Thank you so much, we really appreciate it. I also want to acknowledge Tasha Morgridge and thank her for giving up her husband to us for the whole day on their last day here in New England before they head back to California for the coming months.

JM: 65 degrees there today!

HB: On behalf of the students, faculty, and both of the Centers, thank you very much.