

The Human Side of New Enterprise
MIT Enterprise Forum
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MIT's Enterprise Forum is a brilliant way to encourage entrepreneurship by creating a forum for mutual learning and by building a network of relationships among like-minded people who share an interest in starting and building companies.

I appreciate this opportunity to share my learning and experience from 35 years of building my company, Analog Devices. Analog Devices is a semiconductor company focused on what we call real world signal processing applications. This year we'll have sales of about \$1.5 billion with about 7500 employees spread throughout the world.

We started the company in the boondocks of Cambridge with modest goals appropriate to our resources and experience and we enlarged the scope of our vision over the years as we grew and developed, but always in a way that was internally and externally consistent and congruent with our vision. We did not have the benefit of venture capital but rather, we boot-strapped our way with sweat capital and retained earnings until we went public four years into the mission.

The most basic question about entrepreneurship is why would you or me or anyone want to start a company anyway? What is the purpose of the enterprise? How do you determine whether or not you've been successful?

If you were able to see out to Cisco or Lucent or AOL for something well north of \$100 million before having made a profit or a sale or even a product and before having to face the risk and hassle of building an organization, then I think we would all agree you were successful regardless of what your purpose had been.

Until recently, to aspire to this outcome would have been considered a fantasy or even lunacy. Today, it happens but still rarely. So if that's your goal, well that's okay, why not, but at least you need a fall-back position.

More typically you start a company because you want to run your own show, because you believe you can do something better that is already being done and because you hope you'll achieve a level of financial independence that will give you the freedom to do whatever you want to do with the rest of your life.

At least that's the way I thought about it. What I found after achieving financial independence was that I liked what I was doing so I just kept doing it. As you get into it and satisfy your personal needs, you begin to think more fundamentally about the purpose of the company, independent of your personal goals. Back in the sixties, most people would say the purpose of an enterprise was to create wealth for its stockholders. I always had trouble with this concept, even though it served my personal interests.

Today, most people would say the purpose of an enterprise is to satisfy the needs of all its stakeholders – its stockholders, customers, employees and suppliers – probably in that order. Based on what I learned from Hewlett-Packard, when I worked there in the 60's, I adopted this stakeholder model long before it became fashionable, except I put employees as first among equals, then customers, then stockholders, then suppliers and then the communities in which we lived and worked.

It's always been a requirement in business that you meet the needs of stockholders, especially for VC's, since otherwise you don't get the money or even if you do get the money, they'll throw you out if you don't meet your promises and their expectations.

And it's pretty obvious that, especially as a newcomer, you've got to meet real needs of customers, conspicuously better than the competition, or else you will soon get into trouble.

Meeting the needs of employees in start-ups is paradoxically more implicit than explicit. This situation derives from the fact that everyone is so committed to survival and success that personal interests are subordinated to customer and stockholder satisfaction. In fact, people often work so hard that social life and family life are seriously compromised not because it's expected or requested, but because they want to.

The start-up environment is the halcyon days for an enterprise. The vision and priorities are crystal clear to everyone and there is a burning desire to achieve every milestone along the way. People are not concerned about who works for whom or who has the authority to make decisions. Everyone just jumps in and works together to get the job done. There's a lot of excitement and satisfaction from your work.

The challenge is how to preserve the magic of the birthing process. As the organization grows and the business becomes more complex, it's difficult to sustain this communal spirit. Many possible avenues for success emerge and the vision can become blurred. An increasing number of objectives begin to compete for scarce resources and conflicts arise over priorities. It becomes necessary to establish business processes to plan, to control, to coordinate action, to establish priorities and to make decisions.

And you need to divide up responsibility, to establish structure and to define authority, which leads to a power structure and pecking order. These transformations tend to inhibit individual freedom to decide and to act.

As this scenario unfolds, as it inevitably does, the individual interests of the parts (employees, teams) can drift away from the collective interests of the whole (company). The challenge is to continue to align the interests of the parts with the interests of the whole company. Thus, employee satisfaction must become an explicit goal with an explicit philosophy and strategy for meeting employee needs. In fact, it can be argued that attracting and retaining employees is the biggest challenge for early stage companies today.

So the question is, what do employees want from their association with the company? Maslow's hierarchy of needs is still a good place to start.

At the most basic level people want to feel secure in earning a living to cover the basic requirements of life which goes a lot further these days than just food and shelter. You've got to educate your kids, acquire and maintain your BMW, vacation in the Caribbean and address all those other essentials of modern life. People want to work in an environment where they can enjoy friendship and collaboration with interesting associates who are open, honest and helpful.

They want to be part of an organization that's the best at what it does and that's successful in reaching its goals. They want to be recognized and rewarded fairly for their contributions to that success.

People want to be challenged to work to their fullest capabilities and even to be stretched beyond their capabilities as a way to grow and develop. They like an environment which encourages boldness and risk-taking, which accepts failure as a possible outcome of pushing the envelope and which sees in failure an opportunity to learn.

People want to be treated fairly and with respect. Most of all, people want the freedom to decide what to do and how to do it once the overarching vision and objectives are determined.

How do you go about assuring that these basic needs are met? To start, you need to focus on continuously improving the quality of the work environment by initiating a number of programs that are known as satisfiers, not all at once, but gradually over time. For example, recognition is a strong, universal yet often neglected need and it's so easy to address. You just have to realize it's important and do it. There are hundreds of good models out there to copy. For example, one company I visited that stressed innovation as their primary success factor had pictures in the lobby of everyone who had been awarded patents along with the dates and titles of the patents. What a powerful message.

In thinking about these programs you need to distinguish between improving the quality of work-life, the quality of individual ability and the quality of teamwork and to make sure you address all aspects.

And you need a way to gauge where you stand and where corrective actions are required. One way is surveys. A better way, is for senior managers to meet frequently with small groups to solicit feedback. Are people having fun, feeling important and valued and proud of what they and the company are accomplishing?

A less tangible, but perhaps more important challenge is to establish a culture which respects the dignity of each person, which values the diversity and uniqueness which every person brings to the team and which encourages teamwork and high quality relationships as prerequisites for high performance organizations.

In the beginning, the way the leader and other senior managers act, speak and listen and the way they behave with subordinates and especially with each other sets the tone of the place and begins to form the culture. Everyone watches your behavior and takes their cues. Are you open, honest, fair, caring?

There are certain values and behaviors you want to reinforce and you do this mostly by example as manifest in your way of being. But as you grow larger, you have to write this stuff down and embed your values and beliefs in your performance management system and in your approach to coaching and

developing people. You have to be explicit about the behaviors you want and don't want. These values become the invisible glue which holds an organization together.

In my view there is no alternative today to some form of a Theory Y, participative human resource philosophy which is implied by the highest levels of Maslow's hierarchy of needs. Today employees have a lot of options about where they work. The best and brightest people want an environment which encourages and helps them to develop and advance to their full potential and which gives them the broadest latitude and freedom to exercise their judgment.

If you accept this view, then there is no need to reinvent the wheel in articulating your business and human philosophy. Rather, steal shamelessly from the best. For example, Hewlett-Packard wrote their corporate objective in 1957 and it's changed very little since that time. When we wrote our corporate objective in 1972, we essentially copied HP because what they said then made so much sense. We added a section on human resource philosophy to emphasize our commitment to employee satisfaction and the values and beliefs we wanted to inculcate.

To be more explicit, let me read the Preface of our HR Philosophy: "At Analog Devices we view business as a human process, the ultimate goal of which is to satisfy the needs and aspirations of the people associated with the firm – primarily our employees, our customers and our stockholders."

As regards employees, we say "our goal is to create an environment in which each person feels affiliated with honest, interesting and helpful people, engaged in worthwhile and challenging tasks, achieving results for which they are proud, recognized and rewarded – an environment in which each person's capability is challenged and occasionally exceeded, this stimulating and directing the development process."

Here are some of the basic beliefs about people which we articulate in our philosophy and consciously reinforce and perpetuate at Analog Devices.

We believe:

- That people are honest and trustworthy.
- That people want to contribute to their full potential.
- And that people want to be recognized and rewarded for their accomplishments.

We believe:

- That individual initiative and innovation are essential to success.
- But learning to work in teams is also key.

We believe:

- That risk is inherent in our business.
- And that failure of programs should not equate to failure of people.
- And when breakdowns occur, blame the system and fix it, don't blame the people.

Writing this stuff down is the easy part, committing your way of being to live what you say and to achieve consistent behavior throughout the organization is the hard part.

As a simple example, we say we believe people are honest and trustworthy. As a result, in the early days we resisted putting guards at the doors or requiring people to wear badges, even against strong voices to the contrary. As a result, we've lost some PC's and other equipment over the years, but nothing very significant. It's a small way of saying we trust you. We make an exception in our wafer fab facilities, since a belligerent intruder here can cause unacceptable damage.

Our business strategy is also strongly influenced by our philosophy about people. Human beings have always been motivated to discover the unknown, to create new knowledge, to find better and different ways of doing things, to be the best at what they do.

A business strategy which achieves leadership in its market niche gives expression to this human aspiration and opens opportunities for individual and group fulfillment. People want to be part of an organization that is creating the future and controlling its destiny. They want to be part of a winning team.

A cornerstone of our business strategy has always been to tackle opportunities where we can be *the* leader or at least *a* leader. In 75% of our product lines, we have the largest market share.

Market leadership is sustained through the innovation process which not only satisfies customers' needs and creates economic wealth, but also nourishes basic human drives for discovery and creativity.

People seek purpose in their work. Innovation implies not just invention, but also creation of something that customers care about and value.

The biggest reward for engineers is for them to see their products sell big time and better yet to become the acknowledged industry standards. This sparks pride and touches deep-rooted needs for recognition.

People want to be affiliated with and to learn from the very best people in their field. The best gravitate to the place that is committed to discovering and to advancing the state-of-the-art.

Our spirit of innovation, entrepreneurship and leadership, and our commitment to learning and improvement are intangible but important reasons why people come and stay at Analog Devices. As you grow larger, it takes a lot of proactive effort and initiative to sustain this spirit of adventure. There are many pressures to play it safe and to "prove it to me." At Analog Devices we bet on people more than we bet on the numbers. Nobody knows the future. In the end we depend on the judgment of our people. Competitiveness in high tech comes down to competence of our team versus their team.

One of the themes that I have consistently emphasized at Analog Devices is the paramount importance of building trustful relationships with employees, customers, stockholders and suppliers.

Trustful relationships start a commitment to openness, honesty and integrity. But also, people want to deal with individuals and organizations who are sincere, reliable and competent and who have the resources to back up their commitments.

For example, with customers our goal is not just to deliver products and services which generate satisfaction or even delight, but more importantly, to build long term trustful relationships by consistently meeting our commitments and by responding to and quickly resolving problems as they arise. If you win the trust and confidence of your customers, they will share with you their deepest concerns which allows you to offer solutions that are invisible to competitors.

One story that always stuck in my mind was about a computer company that was having a lot of delivery problems. They hired a consulting company to help and as one step they benchmarked best industry practices. What they learned was that HP stood out on delivery performance. On closer examination, however, they found that HP's delivery to promise date was no better than their client's. But when HP was going to miss delivery, they notified the customer well in advance and worked with them to minimize the impact. This showed that HP cared about their customers which actually strengthened their image and relationship even in the face of disappointments.

Trustful relationships between the company's leaders and its employees is also of paramount importance, which also comes down to demonstrating through words and deeds, large and small, that the company cares about their welfare. But this is not enough. Trustful relationships between groups and between people within the organization are also key to building high performance organizations through more effective teamwork and cooperation.

One approach to building trustful relationships beyond the essentials of openness, honesty and integrity is to focus on conversations and networks of conversations as the most important process by which work is done in team based organizations.

Visions are created with language. Possibilities are discovered through conversations. Alignment is achieved through conversation. Coordination is managed through conversation. Motivation is inspired by conversation. Breakdowns are dissolved through conversations. Learning is achieved through conversation. Relationships are enhanced through conversation.

So we can say that the most important and universal process that leaders use is conversation, and the most important skill is the ability to make intended actions occur through articulating, eliciting and coordinating commitments. The fact is, many managers don't do this very well.

A fundamental problem that leads to misunderstanding in conversations is the basic assumption that what I say is what you hear. In reality the words we speak don't always accurately represent our intended meaning. Moreover, what is heard is filtered by the listener's beliefs, background and experience and very importantly by the emotion and mood of the moment. (Example: performance review)

A lot of waste can be avoided as well as damage to relationships by taking more responsibility for the interpretation of what we say and what the other person hears. For example, for better listening we can say, "Now let me repeat what I heard you say to see if that is what you intended," and for better speaking we can say, "Now tell me what you heard me say to see if that is what I intended."

There's much more we can learn to improve our conversation skills which I believe is very important. In the time available tonight I can't go into the details but I would like to give you a sense of what I have in mind. For example, we can distinguish between different categories of conversations and different conceptual models for improving conversations as a process.

Just to illustrate, there are conversations for relationships, conversations for possibilities and conversations for action. We are born and nurtured to approach conversations for relationships and possibilities with a uniview of the world. That is, the way I see the world is the way it is and the goal of conversation is to impose my views to overwhelm yours. This view is especially prevalent among young engineers.

An alternative is to accept that there can be several views of the world which are equally valid, depending on your background experience, belief, etc. In this model, the goal of conversations is to discover and value multi-views of the world and to search for areas of agreement on shared concerns that will lead to mutually beneficial actions.

To arrive at a multi-view, we need a shared model of how reasoning occurs and inferences are made. In a conversation, we select from available facts and data those which are relevant to us. We then make inferences from the selected facts and data, draw conclusions and make decisions and then take action.

This ladder of reasoning usually occurs unconsciously with lightning speed. The facts we select and the inferences we make are strongly influenced by our beliefs, experience, background, culture and a whole host of other factors that constitute the observer that we are. In this respect, every person is unique in the way they see the world.

A multi-view is created by consciously drilling down each other's ladder of reasoning in a given situation to understand the facts and data that were selected, the basis for the inferences made and the background and beliefs which influenced each other's reasoning process. From this kind of open, exploratory conversation we discover shared concerns which then form the basis for coordinated action to achieve shared goals.

Another method for achieving alignment, I'll mention briefly, is balancing inquiry and advocacy. Mostly, as I just said, we approach conversations with high advocacy in trying to impose our view of the world on others. A more constructive way to advocate is by explaining our position by stepping through the ladder of reasoning as I pointed out.

Inquiry can take the form of interrogation which is offensive. Alternatively, we can adopt an interview style which sincerely seeks to understand the other person's ladder of reasoning. Productive conversations balance inquiry and advocacy so as to encourage mutual learning and to avoid over-engaging.

Conversations are like a dance in which both partners must learn the steps and be willing to practice. By exercising these simple steps, you can greatly improve the quality of relationships and open new possibilities for action.

About 70% of the conversations we hold in a business context are conversations for action, that is, requests and promises on the one hand or offers and acceptances on the other. A lot of breakdowns and misunderstandings occur because we are sloppy in our approach to these conversations. This atom of work is a model which helps to improve the clarity of requests and promises and the reliability of commitments.

Specifically, the process involves negotiating explicit conditions of satisfaction upfront which are clear to both the customer and performer, and creating an environment where promises are taken seriously, where the performer promptly gets back to the customer if something comes up where the conditions cannot be met and where the performer closes the loop on completion to make sure that the customers' needs were in fact satisfied.

Work in organizations gets done through a network of conversations in which the performer in one step in the process becomes the customer in the next. As we know from experience, a breakdown in any link of the network becomes a problem for a lot of people and requires continuous expediting. Developing a culture where people take their commitments to each other seriously is essential to creating a high performance organization which delivers satisfaction to the ultimate paying customers while creating a hassle-free work environment.

Engineers and scientists are trained to be like Spock, to take emotions out of the equation and to rely solely on facts and logic. And we are told at an early age to not let our emotions sway our decisions. Clearly the scientific model has an important role, but on the other hand, we cannot or should not deny the powerful role which emotions play in people's lives.

The biggest lesson that engineers must learn in making the transition to a manager or even a team leader is that people's ambition and motivation on the one hand or resignation and fear on the other are stimulated through the emotional part of the brain, not through the cognitive part. Facts and logic alone do not inspire people and organizations to accomplish great things. The limbic or emotional system is accessed through conversations. Vision may be created in the cortex, but new realities in the world are created through the words we speak and how we speak them. The role of the leader at every level of the organization is to create a positive, ambitious mood in which people are inspired to work to their full potential and to accomplish extraordinary feats. So when it comes to people and organizations, we cannot shy away from our emotions. To the contrary, we must embrace and harness the emotional energy for which human beings seek expression. It's through conversational competence that we do this.

In a broader sense, I assert that doing what comes naturally in speaking and listening is often not effective. A lot of waste, inefficiencies, bad relationships and lost opportunities can be avoided by enhancing our conversation competence and learning to design conversations to achieve intended outcomes.

We are living through a massive paradigm shift in the way organizations are managed which is best characterized by Russell Ackoff's first axiom of systems thinking, namely, that "the performance of an organization depends much more on how the parts work together than on how well they work

separately.” In fact, Ackoff goes on to say that by optimizing the performance of the parts, you systemically suboptimized the performance of the whole. Traditionally, division of responsibilities between the parts was predicated on the maxim “you do your part and I’ll do mine and by the way, staff off my turf.” In high performance organizations people are committed to each other’s success. To succeed as an individual, the team or organization of which you are a part must succeed and thus it is in your self-interest to reach across the boundaries of assigned responsibility to help others achieve shared goals. It took me half of my adult life to begin to understand the power of systems thinking. 50/50 relationships don’t work nearly as well as those in which all players are committed to do more than their fair share.

In command and control organizations, emphasis is placed on vertical lines of authority and on reporting relationships and measurement systems which tend to optimize the performance of the parts. In high performance organizations, the most important relationships are the horizontal interactions between the parts which are driven by commitments to shared goals.

Drawing on our experience from Total Quality Management, the best way to think about organizations is as parallel structures. The attributes of both structures are needed to address different kinds of issues. The traditional hierarchy focuses on control, on compliance to standards, policies and legal constraints and on authority to make decisions quickly where there is an emergency or sense of urgency.

The network or cross-functional team based structure focuses on learning, improvement and development by empowering teams of people with the best skills and experience independent of their rank or functional position in the hierarchy. Decisions are reached more through consensus and a democratic participatory process than through authority in order to gain the benefits of multiviews and the motivation from empowerment. When the process doesn’t converge toward consensus, deadlocks are broken by deferring decisions to the team leader or the team sponsor.

The management principles which apply to these two paradigms are very different as I’ve illustrated here. The choice is not either/or. Managers must be skilled at both and at deciding when and where to apply one approach versus the other.

However, our life experience is so permeated by the command and control paradigm that many managers have difficulty functioning in an ambivalent environment. They are uncomfortable with empowering subordinates to act independently in cross-functional teams and with accepting the decisions of these teams as requirements for their area of responsibility.

By the same token, people working in teams often have greater allegiance to their bosses than to the team, since they perceive that the boss has more influence on their career progression.

To operate effectively in both domains, functional managers must learn new skills and adapt to different roles, from being the boss to being the coach, facilitator and sponsor of teams – from controlling people to developing people and supplying people where they are most needed – from a functional orientation to a cross-functional orientation which focuses on optimizing the interactions.

It's important also to note that in our quest for more democratic management we do not disempower our leaders to lead. In the end, process is no substitute for the emotional energy which great leaders can inspire by their vision and their commitment to succeed.

Greta leaders first and foremost know that they must win the trust and support of the organization in order to have the slack to be courageous and bold and to sometimes be wrong.

Contrary to conventional wisdom, in my view, the role of leaders is not primarily to make decisions, but rather to encourage others to make decisions and, more importantly, to make commitments and to take ownership for outcomes.

By articulating a compelling vision, the leader leads through enrollment and inspiration instead of by authority and power of position. But there are times when it's necessary and appropriate for leaders to use their power to absorb the risk for bold decisions, to break deadlocks or to move debate beyond trivia.

In conclusion, having the best product that beats the competition hands-down is a necessary but not sufficient condition for start-ups to make it through the maze and dodge the unforeseen bullets they'll face. High technology companies like any other companies are more about people and the human side of the equation than they are about science and engineering. Employees today have high expectations and a plethora of options to achieve their goals. With a compelling vision in hand, goal one for leaders is attracting and retaining the human resources required to achieve the vision. Goal two is creating a work environment where people are motivated to work productively and harmoniously together at their peak capability. Goal three is to engender the belief and hope that the company will be successful in meeting its goals.

A successful enterprise is not a zero sum game in which the interests of employees, customers and stockholders are in conflict and in some way must be traded off. Rather, there is or there can be a virtuous cycle in which satisfaction at one level generates satisfaction at the next in a process that is positively reinforcing. The energy for this virtuous cycle is derived from satisfied and motivated employees and thus they are or should be the first among equals in shaping the philosophy, objectives and strategies of the firm.

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Q & A

Question:

How does an organization prevent personal rivalries that inevitably develop as an organization grows and becomes more complex?

Ray's Answer:

Well, it takes a continuous and concerted effort to overcome the frailties of human nature. You have to start by articulating a philosophy that emphasizes the importance of high quality relationships between people and reminds people that the performance of the organization depends on how well the parts work together. You have to remind people that their success is tied to the success of their team and the company. You can also use performance appraisal and promotion as ways to reinforce the principles. Ultimately you can intervene more directly. Of course, human beings will always squabble a bit here and there, but you have got to find some way to get people to work constructively together and if you can't, then that can become the basis for personnel changes. So it ultimately comes down to letting people know that you are really serious about it. At the same time, one has to be respectful of the fact that we are human, we do act emotionally at times, we do see the world differently. That's why I emphasized conversational skills. Getting people to use the same language and methods to create multi-views and to respect the basis for different viewpoints goes a long way. But sometimes you have to escalate differences and conflicts with honor to find resolution. That is, there are times when people are going to drill down each other's ladder of inference and reasoning and in the end say it's great, but we just basically disagree. Then there has to be a commitment in the organization to not let these differences linger and fester. Rather, you encourage and even require that people escalate these differences with honor – that is, with a clear understanding of the differences – for resolution through the chain of command. There is no simple answer to your question, but it has been my experience that if you clearly articulate this ideal and if you make it clear that you are serious about it, you can make a lot of progress.

Question from Greg in Toronto:

Give a relative weighting that you might put on the value of leadership and try not to be modest in your own capabilities, and maybe tell us whether you found that you could hire good people or whether you ended up growing good people.

Ray's answer:

Well, both ways are important in developing organizations. Sometimes you wonder if you had your life to live over again, what would you do differently? In my case, I would put a great deal more emphasis on developing people and internal promotion. We had too much of a tendency to wait until we needed someone with 20 years experience and go hire them. One place in the company where we didn't do it this way was in Ireland. We started a division in Ireland - the first semiconductor operation in that country - before they knew how to spell IC. There wasn't any infrastructure and nobody over there had experience in this industry. In fact, many people wondered why we went there. But the facts are that they have very talented people coming out of their technical universities. The only way we could make it in Ireland was every year go to the college campuses, hire the best and brightest, bring them in and train them with the small group of experienced people we sent over there. We started this process in 1976 and 20 years later not only is the place now filled up with talent, but they have consistently exported talent to the rest of Analog Devices. Every place you go at Analog you hear Irish brogues. Looking back, this experience illustrates the great power of consistently developing young people over long periods of time.

Greg in Toronto:

Are you going to keep the name Analog Devices in this digital world?

Ray's Answer:

Forever. Finally, the world is coming to understand where the real action is.

Question from the audience:

Two questions. First, over the past 30 years or so, what have you seen in terms of change in the priorities as to what employees want. And secondly, could you comment on the

challenges presented to conversations and relationships in this world of voice messaging and electronic messaging.

Ray's Answer:

Fundamentally, people haven't changed that much over the decades that I've been involved. There have been a lot of studies about what people look for in their work, particularly in high tech companies. At the top of this list, then and now, is the desire for challenging work and an opportunity to work with people from whom you can learn. Self actualization is still at the top of the hierarchy of needs and is still a great motivator. Next, people want a work environment where they are respected, valued, recognized and rewarded for their achievements. After that a lot of other factors come into play. If anything, compensation may have moved up a couple of notches to a strong number three. When people see all these instant millionaires, they ask, why not me? So that does enter into the psyche, but frankly my observation - at least as a larger company and even in my involvement with start-up companies - goal number one in recruiting and retaining people is the challenge of the job, the quality of the people that they work with and can learn from, and the quality of the environment.

With respect to your question about the role of conversation skills in the world of e-mail, voice mail, etc., there are distinctions that I mentioned between conversations for relationships, conversations for possibilities, conversations for action. The one thing that you don't want to use e-mail for is conversations for relationships. Often people jump directly to conversations for action, even when they don't know anything about the people they are dealing with. One of the things I observed in traveling to Japan over many years - and I think we have all experienced this - is all this chit-chat that goes on up front, getting ready. Americans want to get to the deal without a lot of green tea or sake. The Japanese have learned the vital importance of trustful relationships. The Chinese as well. They believe if you don't get that part right, there's no need to talk about the deal. I think Americans are a little bit impetuous in wanting to get to the deal. Developing mutual understanding and trustful relationships is an important prelude to successful conversations for action. So you can't rush that part. Once you have established

relationships, then e-mail is a very efficient way to communicate. But still the gap between what you say or intend to say and what the other person hears is just as difficult with the words you type or, even worse, as with the words that come out of your mouth. And it's easier to drill down the ladder of inference in person than remotely with inherent delays in responses. So for mature relationships, e-mail and voice-mail work. But it's not a great way to get acquainted.

Bill from Austin:

With the times demanding such quick growth of companies, how do you balance building culture within a company and the growth of the company. Are these philosophies being taught in industry and schools and is it truly realistic that these philosophies be adopted in our profit-oriented financial markets?

Ray's Answer:

I've observed that people come to positions of leadership with predilections about the proper behavior they want to inculcate and reinforce. The behavior and interaction of the leader sets the tone and the stage. It's really through what you do and how you do it that you build the culture. One of the requirements of leadership is to continuously learn. One has to learn which actions and which behaviors work most productively. So you create that culture by doing.

At some point as the organization grows larger you have to take time out and formalize your thoughts and write this stuff down. We didn't write down our corporate objective and human resources philosophy until seven years into the game. We had from '65 to '72 to warm up. A culture evolves one way or the other. The objective is to have the culture come out to be what you want it to be. There is nothing more important. A lot of that, incidentally, is done through your hiring process, through factors you emphasize in your selection of people and in your promotions.

Now on the subject of whether or not this stuff works and whether or not it is taught anywhere, here at MIT, Peter Senge established the Organization Learning Center that

has done a lot of work in this area based on the work of pioneers like Jay Forrester and Chris Argyris. Also, Russ Ackoff, at the University of Pennsylvania's Wharton School, was a seminal thinker and important influence. It's interesting that neither of these pioneering programs survived the academic environments at MIT and Penn.

Lots of studies have been done about what makes high performance organizations tick. Of course, strategy is important in picking the right technologies, products and markets. But there is a lot of evidence that it's the soft stuff that distinguishes the companies that are built to last; that is, the way companies treat people and facilitate their interaction. In my view, business schools don't do a great job in this area since this is in the domain of practitioners. I have often thought that MIT and other engineering schools need a course which introduces the soft stuff to engineers, that is, the behavioral aspects of organizations and how to lead and improve the interactions of people and organizations - tools and concepts they can go back to later and learn in more detail as they need them in their work-life. In many ways engineers are oriented through their education to be the antithesis of good team players and to discount the value of high quality relationships.

Question from Donald in Orlando:

You discussed how "what I say is not always what you hear." How does technology and jargon affect this?

Ray's Answer:

I don't think technology is going to do much about this. This is a human skill, a leadership skill that has to be first understood cognitively and then committed to and practiced, and eventually embedded into your way of being. It's not clear to me - although I haven't thought deeply about that question - how technology can help. There is the possibility that technology can accelerate and make more efficient the learning process through various approaches of computer aided learning. There was software developed by Fernando Flores to facilitate the coordination of action - the atom of work - but it never caught on.

This is an area where coaching is vitally important and you can't learn to dance by yourself. You can try, but it's not a lot of fun. You need a partner and if that partner doesn't understand the steps, that's not a lot of fun either. So you basically need a community of learners who share a common language, who have a common understanding of concepts, and who see the benefit of trying to be more effective in the way that they speak and listen to each other and behave toward one another. And it's important for people to give permission to coach each other and to provide real time feedback on how they are doing.

Question from the Audience:

I was curious if you had come across any work that actually allows people to develop their own core values and beliefs which will then allow them to work better since you can't really superimpose beliefs in a community, and everybody has their own words for what the beliefs mean.

Ray's Answer:

There are some sources that I would point out. One is Fernando Flores who wrote a book called "Computers and Cognition" in collaboration with Terry Winograd, who used to be part of the faculty here at MIT. That's one of the best sources of new ways to think about relationships and conversations. Another one is Chris Argyris at Harvard University who has done a lot of work in an area called action science. Then there's the work in systems thinking by Russell Ackoff and Jay Forrester, and the work of Peter Senge and others at what used to be MIT's Organization Learning Center.

It's through the inquiry process and the ladder of reasoning that you begin to understand each other's value and beliefs. Recently I met with a group of women at Analog Devices. They were talking about the issues they face in their jobs every day, many of which I was totally blind to. I just never sat down and really, really listened to a thoughtful group of women talk about what they are up against. We talked about what should we do to improve the situation and they concluded that the biggest step we could take was to improve the conversation skills in our environment, how we speak and listen

to each other. With a deeper understanding of and sensitivity to the differences in the way we view the world as men and women and with a respect for these differences, many of the problems women face would go away. This learning comes through conversation skills.

Jim from Delaware Valley:

I'm interested in your use of the word conversations. I find that conversations as a term implies some spontaneity and it is clearly differentiated from the term meeting or having meetings per se. Can you talk about how you go about differentiating those two?

Ray's Answer:

Yes. There's a great distinction between conversation and communication. Conversation has three important elements: body, language and emotions that correspond to the different parts of the brain that is the reptilian, the cortex and the limbic systems. The book, Emotional Intelligence, sheds a lot of light on this subject. What we find in conversations is that all these elements are in play. As human beings we are very sensitive to reading these elements in our conversations. Body language is very real. The emotional aspect of conversation is very real. And as I've said, conversation is like a dance. It's a dynamic interchange and it is in that dynamic interchange where we often get lost, where we get hijacked by our emotional, unconscious response. Conversation skills not only require linguistic distinction and reasoning processes, but also learning to cope with our emotions which are constantly present as a part of being human. Meetings are an important setting in which conversations take place in a group or one-on-one.

Paul Brontas:

I'd like to ask a question, a follow-up on that. Are we fighting a losing battle on conversation?. I go back 30 years ago when I used to talk to clients and I could better understand what the goals of my client were and how to satisfy those goals. Today, the average business man - particularly in a high tech area, whether it's in the Internet area or the semiconductor area -- is so busy that conversations are limited. You go to a doctor and you get barely 30 seconds of his time to converse and understand your particular

problems. I think you presented a very rational and prudent approach, but we are having far less conversation and far less communication and therefore we are not going to solve the problems that you've addressed. Am I a fatalist or pessimist?

Ray's Answer:

Well, one of the reasons why I brought up this topic today is because, clearly, today we are living at a faster pace. The pressures are much higher today than when we started our company 35 years ago. Greater leadership skills not only at the top of the company, but leadership in teams, leadership in departments, leadership at all levels of our organizations is one way to cope with this faster pace and therefore is not something that should be left to chance. Otherwise, you end up with suboptimum performance. In my opinion it is essential that you find a way to accelerate the development of leadership skills. You can't wait 10 or 15 years for people to learn from their mistakes. Some people learn leadership skills through the school of hard knocks over many years and some people are just born natural leaders who learn very fast. I certainly wasn't amongst the natural born. I learned the hard way. I wish I had had a coach who would have helped me understand some of these things much earlier in the game. Today, we can and must help people learn leadership skills earlier in their careers. Today there are tools and methods like conversation skills which can accelerate the learning process.

In my opinion there is a deep hunger for this stuff. If you go back to the hierarchy of needs, relationships and socialization between people is a very deep-rooted need. One of the reasons that people say they like working at Analog is because they experience supportive relationships among employees. They don't like working in an environment where people are at each other's throats. It's not fun. It's stressful. So I think that there is the need, the desire and the means for organizations to harness the power of more effective conversations to align the energy of people toward common goals. So I guess I'm more optimistic that the soft stuff will grow in importance in response to the fast pace of our times.

Milt from Michigan:

If you look at most annual reports nowadays, they stress the fact that people are their most important asset. That seems to be true when empowerment activities are well supported. The company is doing well. However, in terms of when companies go through down-sizing activities, trying to merge their acquisitions, the board of directors and Wall Street are on top of them, most CEOs revert to a traditional command and control structure. How would you advise both top and mid-level managers to maintain their people focus and value the people focus as a way of working through those problems? How did you yourself do that?

Ray's Answer:

Well, first of all, I made the point that in terms of the hierarchy versus the cross-functional networking team environment, it is not an either/or situation. Companies need both sides of that equation. There are in fact times when reverting to command and control is not necessarily bad. As a matter of fact, it's required. It is a question of deciding on what issues, at what times, under what circumstances it is better to take charge than it is to try to reach consensus. Sometimes there is need to make very dramatic changes in an organization and this requires leadership and harsh actions like down-sizing for survival. So we should not get into a situation where leaders are disempowered to lead.

The question is, when do you keep your commitment to employee satisfaction and human need versus the stockholders and the analysts? That's a balancing act which the stock market environment today makes incredibly difficult. It's a real scourge because analysts don't want to hear about missing the quarter even by a little bit. They don't want to hear about long term stuff and building for the future. They just don't want to feel the pain because they were dumb enough to recommend the stock at higher prices than they should have. They push that responsibility back to companies and how you accept or don't accept that responsibility is one of the great challenges of public companies in America today. You have to develop a relationship with your investment community where you are up front with them and where you make it clear your job is not to meet their short term earnings forecast. That's not the reason you're playing the game.

You have to be willing to take a hit from time to time. So it's a very complex question and a very real problem for public companies today who need continuously increasing stock prices to attract and retain key employees through options. Making the calls on the trade-off between short term and long term results is the skill of a leader.

Stephen from Delaware Valley:

What was it about the hired president that made you decide to change leadership and why did you choose yourself as the next leader rather than your partner?

Ray's Answer:

My partner wanted out. He said enough already. I just want the money. So relatively early in the game he left the company and that was the basis of our initial public offering, to allow him to bail out, at least partially. At that time having recently graduated as an EE from MIT, I had an abysmal understanding of what leadership was all about. I really thought that the job of a president was something like a super clerk. By and large the job of the president was to assign parking spaces and to figure out the benefits and all the other administrative crap as opposed to figuring out what products we should make and how to keep our customers happy, which is what I wanted to do. And besides, I didn't feel I was qualified for this job whatever this job was. What I didn't count on was that the president would figure he was running the show. It was logical enough if you elect someone to this job. But in the end I had the shares and a heavily vested interest in the outcome. So I went along as long as it was working out okay. But when it got to the point where it was obvious that this guy was driving us toward a cliff, I went to Paul and said, "Paul, I got the votes. This has got to stop," primarily because I learned that this person didn't have the skills to lead a technology based company. I wasn't well prepared for the job, but I was sure I could do a better job than was being done. One possibility was to find someone else from the outside, but we just went through that and it didn't work. So I concluded I had to do it and had to learn whatever I needed to know to do the job, superclerk or not. One of the most important things I did in making this change after convincing Paul and the other directors to let me do it, having previously I told them I wasn't qualified, was to go to the employees and ask for their help. In the first meeting as

President, I explained why we made this change. I said I believed I could lead the company but I didn't yet have all the skills and knowledge that they would expect from a president. So I pledged to them that I was going to work my butt off to learn whatever I needed to know. And while I was learning I asked them to give me some slack and a lot of support. I promised I would either get there or I would get out. In hindsight this was brilliant because everybody grabbed hold of the horns; there was no way they were going to let me fail.

Question in Kresge:

I would be interested in the barriers to learning the kind of conversation skills you've talked about.

Ray's Answer:

I tried introducing these ideas at a time when Analog was getting upwards toward a billion dollars - a fairly large, complicated organization. One of the things that everybody acknowledges is that it is very hard to teach old dogs new tricks, particularly those who ascend to high levels of responsibility in corporations. I found it difficult to get the senior management of Analog to buy into this stuff with the same intensity that I did. The now CEO of Analog did buy in but in a very different way. He learns in a very different way from me. But he did learn and he does practice it. But it is very difficult to get people who are already in positions of responsibility and who have already demonstrated success and knowledge and capability to make such fundamental change. Having said that, I do think we penetrated the veils at Analog. When an organization starts learning a new paradigm, it shows up in the language they use. You hear this new language being used in a lot of places at Analog Devices today. I'm now the Acting General Manager in a new division at Analog that's still relatively young. It's like a start-up within a company. This is a better environment to introduce change because you can really work with the organization and get people to learn and to practice new ideas. It's much easier than starting with a billion-dollar company. But nonetheless I do think that there are a lot of large companies that need to change, and I believe these techniques and these ideas can be helpful. It starts with the articulation of a vision. It starts with

beginning to talk about the importance of the quality of relationships and the way you draw your organization chart. Simple things like hammering home the point that the performance of the organization is much more dependent on the way the parts work together than on how they work separately. Most importantly the leaders at the top have to be the role model for the behavioral change you are trying to achieve, and they have to learn to coach others.

James from San Diego:

When you chose to establish operations in Ireland, you apparently admired the education level and the talent level there. What do you think corporations can do to elevate or to stimulate educational practices here in the U.S?

Ray's Answer:

I certainly wouldn't imply by what I said that while the level of education and competency of the people in Ireland is admirable, that it was or is necessarily superior to what's here in the United States, particularly at the university level. We have great institutions of higher education. There's a lot of rethinking going on about engineering education and appropriately so. There's a lot of rethinking going on in K through 12 about how to get more people interested in engineering and science careers and how to improve math, science and critical thinking skills of high school graduates and appropriately so. Still missing from the engineering curriculum is an introduction to the behavioral aspects of how organizations function, how people work together and why leadership skills are important and how to develop them. MIT now has a 5-year master's degree program in the EECS department as the first professional degree. Part of that fifth year is allocated to broadening the skills of engineers in areas other than just the technology. My sense is that MIT is still struggling with how to do this. I believe that something along the lines we've been discussing is part of the answer and that learning about the best practices in industry are the best places to start.

Question from Kresge:

With today's job market being so difficult to attract new employees, I think a lot of companies are faced with the choice of quality versus quantity. I'm wondering what you suggest - obviously you place a very high value on employees - whether it's better to wait for the rainmakers when you can afford their salaries and find them or take the plunge on more borderline candidates or rookies who are untested and what kinds of guidelines you use in making those decisions.

Ray's Answer:

You used the word rainmakers. I would use the word quality at every level. Certainly the advice I would give is to have very high standards. Eventually you've got to hire somebody so the standards have to be realistic. But keep the bar high, particularly in the early days, and particularly as it relates to your leadership team. They don't have to be people with twenty years experience. There's a lot of 30-year-olds today who are quite competent and capable of leading. But they have got to exhibit quality not only in technical knowledge but also in how they think about people and in their ability to work with people and earn their respect and trust. A brilliant egotist is not what you need in a start-up company. If you have to make a trade-off, I'd say a few less points of IQ and a little more ability to interact with people is the way to go. I'm working with a start-up company here in this area now. The CEO worked extremely hard to maintain very high standards even in this tight labor market. They have been able to hire 100 people who do the work of 200 employees in most companies. They just could not have developed the complex, innovative product they undertook without very talented people who worked well together.

Question in Kresge:

When you have 20 or 30 minutes to interview somebody and try to size them up, what's one or two of your favorite interview questions? And what are the various answers?

Ray's Answer:

I pose dichotomies in terms of management style, risk orientation, career goals, life style and ask where they position themselves and why; for example, on management style,

where do you fit between a hard ass and a pussy cat? There are no right answers. I get people to talk about who they are, how they have been successful, how they get things done, how the boss, subordinates and peers would describe their strengths and weaknesses, where they have failed and why, where they stand in terms of their need for control and their need for ego satisfaction. In the last analysis, interviews are not as useful as digging out references from people who have worked with them to answer these same questions and to better understand the soft side of the equation. I also put a value on people, other things being equal, that have worked for companies like Hewlett-Packard who are known for being well managed and for developing people. People learn a lot working for well managed companies.

Question from Kresge:

How do you address skepticism about the soft side when you are talking to business people? Are there any quantifiable success factors that you can point out to address that skepticism about the success of these initiatives?

Ray's Answer:

In a way I'm surprised that two questions have come from along this line tonight. It seems to me that most of the stories you read about outstandingly successful companies talk about the quality of leadership and the way these companies treat and value their employees. It seems to me that all great leaders have a sensitivity to the human side of the business equation and the ability to win the trust and the confidence of the people in the organization. So at that level of abstraction it surprise me that there would be much doubt about the importance of the soft stuff. Now when you start talking about particular approaches and techniques, it may be difficult to get the attention of so-called business people, depending on how it is presented and by whom. It's true also that many of these ideas like conversation skills are new and it's difficult to prove cause/effect relationships in success stories. But these are in some respects just new ways to talk about leadership skills that are already well recognized as important success factors. For example, venture capitalists have a checklist that has been proven out over time and on the top of the list is the quality of the leader. Even if there's a great product for a

promising market, the best VC's will walk if they don't first of all believe the business proposal comes with a convincing leader. What we are talking about is how to operationalize and accelerate the development of leadership skills by recognizing that conversations and attention to human values and needs play a large role. The challenge is, how do you teach and learn the soft stuff earlier in the career cycle before committing so many mistakes in the learning process?

Question at Kresge:

When Jack Welch introduced the Sigma quality program and talked about people with black belts and rating them that way, how was that first received? When I first heard about it, I thought it sounds gimmicky. But he made it work, apparently, to the tune of hundreds of millions of dollars in savings achieved by each of his major divisions.

Ray's Answer:

I'm not a scholar on Jack Welch. I don't know all the bits and pieces. I know at one time he was also known as neutron Jack. So again, different styles are required for different situations. When a company or a division is going down the tubes because of mismanagement or market shifts or whatever, you've got to bring about significant change and maybe the only way you can get through the first phase is the neutron Jack approach. But at the end of the day when people reflect on Jack and his great achievements at GE, they point to his incredible grasp of the human side of the equation - his great ability to engender the commitment and trust of the organization and to inspire people to achieve extraordinary results. Jack Welch well understands the soft stuff and he practices it every day of his life.