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I was asked to talk to you today about MITRE's goals. That's either a very easy or a very difficult topic, depending ^{on} how you look at it. I'll begin with the easy part. Some years ago I was having dinner with a friend. He asked me what my long-term goals for MITRE were; and without really thinking about it, I replied that some millions of years in the future when the sun is growing cold, the earth is turning into a desert, and there is only one organization left in the world, that organization will be MITRE.

I just sort of blurted it out, of course. But in think about it, it's not as nonsensical as it might seem.

In the first place, I obviously didn't mean that survival per se is the important thing. A few million years from now the present value of that to me or to any of you is pretty small. What I really meant was that I

wanted MITRE to be an organization that really had value, that was recognized to have this value, and, as long as there was civilization and people needed technical support, MITRE was seen as an effective, efficient, reliable way of their getting it. If we were able to do that, we would, in fact, last a long time, because we would deserve to last a long time.

Now that's a very simple statement, What does it really mean? Well, it's easy in talking about goals to talk about reputation, or quality of people, or quality of jobs, and so on. But my personal opinion is that it doesn't make much sense to talk about these as separate things. I think they all go together. Organizations don't stand still. They either get better or they get worse. Good organizations--and by that I mean organizations that are capable and are recognized as being capable--get opportunities to do good jobs. By good jobs I mean important jobs, jobs whose results are really wanted by their customers and so are adequately supported. They get enough money and enough political support to get done. The good organization gets that kind of a job, and in turn that kind of a job attracts good people. With such good people, the good organization is likely to get

the job done successfully. It thereby enhances its reputation. So it ends up with a better reputation, more experience, and better people. These mean more opportunities to do still better jobs, and the good organization keeps getting better.

In contracts, a not-so-good organization has a problem, because the good organization gets the pick of the work and the not-so-good organization has to take second best. Second best means the work is not as important and so does not attract as good people. It's also not as well supported. For both of these reasons, the job is less likely to be successful and the not-so-good organization has a very good chance to get poorer with time. So you can either get better or you can get worse. And getting better is obviously the right thing to do.

To me then this is all a closed cycle, a kind of a triology. Good organizations get good jobs. Good jobs attract good people. Good people make good organizations. The three are inseparable and you can't do one without doing the others. So I think the right goal is to aim to get better every year; to get more capable; to get more

respected; to get more interesting and important work. If we do this we will not only survive, but we'll survive with honor and with ^{work} excitement and satisfaction. If, on the other hand, we fail to get better every year, we'll start to get worse. And in that case, we won't survive for long and I think most of us wouldn't want to. ✓

Now this sounds straightforward enough. So why doesn't every organization have this goal and all try to get better every year? Or perhaps more pointedly, why doesn't ~~this~~ one organization which is best get better and better and take over completely, with all other organizations eventually going out of business? ✓

The answer, of course, is that getting better every year isn't that easy. Organizations of human beings go through life cycles just like biological organizations do. Most organizations start small. Very often, especially in a business like ours, they are set up to do a particular job. If it's an important job and they do it well, they start on the upward path and get better and bigger. After awhile, however, they start to have problems. Their internal communications get more difficult. Also, the people in the organization no longer see it as a unified

entity. ^{So} It loses its commonness of purpose. Finally, it gets "stiff in the joints," i.e., lazy and arrogant and overconfident and inflexible. And it wakes up one day to find that its market has changed and it hasn't followed it. Or perhaps more likely, some younger and hungrier competitor has passed it by. The organizations then has started on the downward path. ✓

Jack Jacobs used to be an officer of MITRE. He interested me in a book by a fellow named Zipf. This book was about the principle of leased work. In it, Zipf said that the reason that organizations die is that as they get older and older it gets harder and harder for them to change and adapt; and after awhile it's too much trouble to change. The organization then dies. And this applies to human organizations as well as to biological organizations. ✓

It seems to me that in lots of cases organizations start out to do a job and they're job-oriented. The concept of accomplishment and service and so on is uppermost in their minds, and so they're very effective. Then they get the job done and the organization and its people are still around. So it looks for more work to do;

and the organization starts to take on a life of its own. If it can get the right kind of work, it continues to be job-oriented. But if it can't, it will get some kind of work because it wants to continue to live. It thus becomes organization-oriented rather than job-oriented and usually tries to become bigger for its own sake. Very often it does as the second stage of its development. But eventually with these goals it loses its internal cohesiveness and starts to seek safety. It loses a willingness to take risks. It becomes a collection of people who are merely looking out for themselves, an organization of separate individuals. And that's the last stage.

Although such an organization may last a long time, particularly if it can put itself into some sort of monopolistic situation or become part of the government, and hence insulate itself from competition. ~~It may last a long time, but~~ it doesn't last in the sense that I'm talking about: getting better.

So where does MITRE fit in^{to} all this? Well, to understand an organization you have to look at its history. MITRE comes, like a great many organizations

today, from seeds that were sown at MIT during World War II where some of us were working at the Servomechanisms Lab. That was just sort of a beginning. World War II had a profound effect on people and on organizations. It provided an enormous amount of high priority work with adequate support. There was lots of opportunity. There was relatively little bureaucracy and interference, because everybody was too busy to do things like that. People expected success and go it; and so they ended up confident that they could get things done. Because there was such a tremendous need, a lot of these people were quite young. In those days people confidently ran large organizations that today we would say, "Gee, he or she is awfully young to do a thing like that." I think of that from time to time and wonder whether we ~~are~~ aren't missing something now.

The Servomechanism's Lab, from our point of view, turned into the Digital Computer Laboratory, which had the good fortune to get started in the new area of computers. But it was really a continuation of our earlier war effort. Importantly, we still had freedom to innovate, because nobody knew anything about computers. And so nobody could tell us what to do. Everything had to be

done for the first time. And it turns out that that's really a pretty good situation to be in, because all of the competition is doing everything for the first time too. The great difference between our experience in those two labs, as I look back on it, is that the climate we worked in during the war, in which everything we were working on had to be done and our job was to go do them without being bothered, was replaced by shortages of money and shortages of support. The digital computer lab was regularly assaulted by somebody who wanted to turn us off and use the money for something else. In fact, we used to get investigated about twice a year. So that gave us a feeling that you didn't have to have everybody's support as long as you believed yourself in what you were doing. You could fight for it and thereby overcome opposition, as long as you were able to recognize that you weren't just involved in technical problems. There were also political problems which had to be dealt with as well.

We were very fortunate that the Digital Computer Laboratory eventually turned into the SAGE system activity at Lincoln Laboratory. I think that the thing that ^{we} ~~that~~ added by our experience at Lincoln, in addition to the self-confidence, the ^f ~~believe~~ in innovation and working in

new areas, and the willingness to confront opposition that we acquired at the previous two laboratories, was that we learned a lot about systems engineering. Once again this was something that although some people had done it in other areas, nobody had done it in our area. And so we had to learn it for ourselves. So we ended up with an organization within the Lincoln Laboratory that had all these backgrounds and all these experiences and all this knowledge. We then convinced the Air Force that a continuing activity of that sort was necessary in the air defense field. Since MIT wasn't willing to provide it, they set up The MITRE Corporation to do it. But we recognized quite well that air defense was a dying business at that time. It was 1958.

The Intercontinental Ballistic Missile had been invented. Nobody knew how to deal with it. It seemed clear that air defense was not a business in which the organization could count on long-term support. And so we turned fairly rapidly to working on things that used the same kinds of background but served different purposes, such as other kinds of military command and control and air traffic control systems. In fact, MITRE actually was diversified when it began. It was working on air traffic control as well as on air defense when it was started.

In any case, the whole sequence of experiences from the Servomechanism's Lab to MITRE caused us to end up with a set of feelings about fundamental technology, and system engineering, and approaches to things that gave the company the character it has today. Self-confidence, too, I think, had a lot to do with it. ✓ ✓ ✓

As I look at MITRE today it seems to me that it embodies really two separate things--both of value, both of importance--but the combination of which is especially significant. One of these is that it is a sound, professional organization in a technical area which has grown enormously over the last few decades and is continuing to grow. That's very important in itself. It means that there are many needs for our help. Secondly, the organization is configured in way that makes it possible to provide long-term support to government agencies without any organizational conflict-of-interest. That's an important thing also. The government has a great deal of trouble in getting qualified, long-term support of this type. It's very difficult for it to get it within the government, because the government has to have rules for running itself which apply to everybody.

And when they attempt to apply them to places like system engineering organizations, they don't fit very well.

The Government has two distinctly different kinds of needs, and MITRE is one of a small class of organizations which can satisfy these needs, especially when required in combination. As I say, MITRE had two things. It has a broad base of competence and it has a particular organizational configuration.

That means that when we have customers who don't recognize the need for that kind of a configuration, or perhaps don't need it, the competence is there. Thus, we can be useful and serve them. Conversely, we can also serve parts of the government that don't need our particular skills as they exist but want our particular form and are willing to give us the support that's required to build a competency in their areas of responsibility. I think that this orthogonal combination of ability and form is very important; and if we handle it properly, it can continue to be very significant to us over the long run.

Now in talking about these things, I haven't said anything about growth. Very often when you ask someone what his plans are, or if you look at plans that are made in the government or in industry or even at The MITRE Corporation, they talk about growth in size. "How big are we going to be next year or five years from now? How many people are we going to have doing that, that, or the other thing?" are the questions being posed in this regard. I believe that growth as such is not a goal for MITRE. Hardly anyone believes me when I say this because we've grown so much that they say you must have that as a goal because you keep doing it. It's not true, however. Our growth has been the result of the goal, not the goal in itself.

There are various dimensions besides size in which an organization can grow, however, to which we do subscribe. It can grow in ability, in reputation, and in performance, for instance, without getting any larger. There aren't very many examples of organizations that have done that, but it is possible. And if at the same time you get better, you do have more opportunities -- and seizing those opportunities implies growing. Growing also means opportunities for people inside the organization. And

let's face it, growth is a measure of corporate success. One of the problems of an organization like MITRE is to find a right measure of success. MITRE, as you know, is a not-for-profit corporation. It's not-for-profit ^{is} one of the characteristics that enables us to establish long-term conflict-free relationships with our government sponsors. So we don't have the usual bottom line. MITRE, as I say, is not-for-profit, but it's also not for loss; and so we aim to have a little left over every year; and so far, we have been able to keep doing that. But that's not the measure. In fact, if we started making a lot of money in the normal sense, our government customers would notice it and take it away from us in one fashion or another.

It is true that if you are doing something right, people will come and ask you to do more things. If you grow then, and grow over a long period of time, it must be some measure of success. There are other measure of success ^{fr} ~~in~~ a not-for-profit like us as well. If you look at MITRE's Board of Trustees, you ^{find} ~~get~~ a similar problem. What is a Board of Trustees. In a profit-seeking concern, a Board represents the owners, the stockholders, the people who put up the money. But nobody put up any money for MITRE, as least no individuals did. The best way I

have of thinking about it is to ^{consider} ~~think~~ that trustees are people who have invested their reputations. They are people with high reputations. They invest these reputations here and there where it pays off. It's therefore ⁱⁿ ~~to~~ their interest to see that the reputation of MITRE grows and that they, as a result, get a profit from investing their reputation in MITRE. If MITRE starts doing things wrong and gets on a downhill path, I imagine that that's going to hurt their reputations; ^{and} ~~so~~, presumably, they'll pay attention and do something to prevent this loss. So reputation is an appropriate measure. It's just that nobody quite knows how to measure it.

We measure it by such things as what people say about us and by our ability to get work. Our trustees, for example, regularly talk to senior people in the government, asking them whether MITRE is doing a good job or not. We measure our reputation in all the ways we can, in fact. Unfortunately, there is no financial accounting standards board for reputation. There is no Coopers & Lybrand for reputation; so it's a little hard to do. As I used to say, suppose there weren't any books, accounting system, or accountants at a profit-seeking firm. So it's Board gets together and the president says: "We had a

wonderful year; we made money hand over fist." The Board replies, "Great!" They then go away and the chairman is sitting next to a friend of his in a club the next day and the friend says, "I hear that that company of yours is about to go bust." And it's bound to worry him, because he hasn't got any measure to refute the charge. And that's the problem with us_x too. ✓

Now what size is right is a complicated question. To me, the right size is one big enough to do the job. And so, if you can agree on the job, you can agree on the size. I don't think you agree on the size and then determine the job from it. There are penalties from size as well as possible losses in efficiency. We at MITRE don't have to grow bigger just to get a satisfactory breadth of skills and jobs. We've had that for a long time. Conversely, I don't believe that the MITRE growth in recent years has created any special new problems for us. I suppose that there is some size of the organization that would create new problems. There may be a size which would create problems that would fundamentally change the character of the company, ^{in fact} But I don't know what those are. And, as far as I can see, for any reasonable size we could expect to go to, I think that whatever problems arose would be solvable. ✓

Rate of growth is a more important question. The faster one grows, the more of everybody's time and energy has to go into growing. You have to attract people, get them in the right place in the organization, and train them. You have to raise money and build buildings, and do all kinds of things. All these use up the time and energy of the people. And so something has to give. If you make the mistake of doing a poorer or a lower quality job in order to grow, then the whole thing is self-correcting because, after a while, people find out about it and they'll stop giving you new work. And you'll stop growing and everything will be all right, except that now you'll be going downhill rather than uphill.

A better way is to reduce the efficiency by the organization and, hence, increase its costs. There is a cost to growing and you can lay that cost on the people who want you to do things. After all, raising prices is an appropriate response to increased demand, we all more or less learned in Economics I. My old boss, Jay Forrester, likens it as follows: There's no problem of getting all the work you want. All you have to do is provide a superior product with immediate delivery,

first-class service, and very low prices; and you're looking at all the business you want. In fact, you'll get more than enough and your problem will be how to cut down the business to what you can handle. He says people have all kinds of techniques. Some deliver a lousy product, others delay things, others won't give you any service. The number of people who merely raise the price isn't very great. I think we tend to fall into that group. It's important to MITRE to keep its costs in line. But at the same time, if it comes to a choice of doing poorer work or costing more money, it's important to spend the money.

Now conversely, shrinking takes a lot of time and energy and it's a lot less fun. Standing still by trying to remain a constant size is really a very poorly understood process. If you shrink, it's a problem. If you grow too fast, it's a problem. So there's some optimum. I think that the optimum for an outfit like ours is a few percent a year. This really takes the last of everybody's time and everybody can then spend their time on the trilogy I mentioned, which is worth the time and energy. If you can maintain such a rate of growth--and it's interesting that MITRE did maintain such a rate for many years in the mid-70's--you double in 15 or 20 years.

This is slow enough so that you've got plenty of time to understand what you're doing and to recognize problems when they come along and solve them.

So about growth, I believe the proper attitude is to keep our eye on the important things, the trilogy I mentioned, the quality of our work, the quality of our product, and the quality of our people and our reputation. If we do, there is going to be plenty of work. If you start getting too much of it, you ought to try to capture the best work available and fend off some of the less good, even if the less good is attractive. Try to hold the growth rate to a few percent and build quality. Now it isn't always possible to do this, particularly if there's a drop in demand for a particular group, and that happens and you all know it. So when it happens and the amount of business for the group goes down, what do you do? Well, we have to try to reject the temptation to take any work that comes along, even if it isn't very good work, just to fill the hole. That's a short-term solution; and if you've got a short-term problem it's all right, but it's really a long-term mistake. Not that we haven't done it from time to time and probably will do it again. But we should try to keep up our quality and take our lumps. One

reason why we have gone to several lengths to have a reasonable diversity of sponsorship for the company is to assure that cut-backs by any one sponsor won't ^{cause} represent too big a lump at any one time. If we have a reasonable commonality of skills so that people can do various things within the organization, and we have enough internal flexibility, we can accept cut-backs in individual areas when we need to. If we maintain these things, I think we can handle our short-term demand problems and come out the better for it in the long run.

Well now, how do I see MITRE? I see MITRE at the moment as a mix of a job-oriented and an organization-oriented company. Our goal is to get better and stronger every year and we do this first by maintaining a broad and highly capable base of knowledge and experience in a number of areas that are widely applicable. They're not only widely applicable now, but they ought to ~~be~~ continued to be important for a long time. Then we do it by tailoring ourselves as an organization that is designed to provide technical support to the government in an even wider range of areas than those in which we're presently working.

Internally, I think it's important to stay flexible and take sensible risks and continually explore new areas. Most important, we have to pay continual attention to the trilogy I mentioned above. We have to obtain good jobs and discourage poor ones, maintain the quality of our output, and make MITRE a good place to work. By that I mean a place not only with a good environment and a fair and honest and professional way of looking at things, but a place of challenge and opportunity.

Now when I say "we" I mean all of us, especially you folks. MITRE has reached a size--in fact it reached a size a long time ago--where I personally can't possibly know what's going on in most of it. I don't know the details of most of what's going on, in fact. But I do know how people are thinking about it. And how people are thinking about it is almost more important. I can tell you, too, what I believe is or should be going on, and I've tried to do that. I look forward in the next couple of days to hearing more about what you believe and what you think ought to be done, so that we can come closer together on this important subject. Thank you.