CONTENT of INTERACTIVE PLANNING

Summary: (Segment three: Content of Interactive Planning)

Dr. Ackoff begins by introducing the six parts or steps of interactive planning: 1) Formulating the mess 2) Ends planning which includes idealized redesign, 3) Means planning 4) Resource planning 5) Organizational and management planning 6) Implementation and control.

He emphasizes that these are not steps that are carried out linearly. As parts of a system, they are inter-related. Since interactive planning is continuous, you can begin with any step. He notes that most planning done today is preoccupied with the last three steps, which are well documented in the literature. He therefore states his intention to focus on the first three steps, with special attention on ends planning. Ends planning includes the key feature of interactive planning, the idealized redesign of the system planned for. Dr. Ackoff then moves into the third step: Means Planning and at the end briefly covers the last three steps of interactive planning.

Contents:

A sampling of books By Dr. Ackoff:

Ackoff, R.L. *Redesigning the Future; A Systems Approach to Societal Problems.* New York. John Wiley & Sons. 1974.

Ackoff, R.L. and Emery, F. E. *On Purposeful Systems.* Intersystems Publications. Seaside, California. 1972, 1981.

Ackoff, R.L. *The Art of Problem Solving (Accompanied by Ackoff's Fables)* New York. John Wiley & Sons. 1978.

Ackoff, R.L. *Management in Small Doses* New York. John Wiley & Sons. 1986

For more detail and supporting information, see "*Redesigning the Future*," listed above, pages 26-33. See also endnotes by Dag Forssell, providing a commentary on this seminar from a Perceptual Control Theory point of view[1].

CONTENT of INTERACTIVE PLANNING

I'd like to start now by looking into content of planning and look very briefly at its processes. There is a difficulty here, because planning itself is a system. All the parts are interrelated. Therefore there is no such thing as a beginning and an end, particularly in continuous planning. Everything reflects on everything else. Unfortunately both our work and our thoughts and particularly our communication is linear, which means we must dissect it in order to treat it in a line. I have dissected the content of planning into six parts.

The danger is that you will conceive of this as six steps. You do step one, finish and then go to two and finish and when you finish step six you are all finished. That never happens in the type of planning we are talking about. You can start anywhere. You never end, so it doesn't make any difference, but each step has a profound effect on the content of each other step. The ordering is simply a reflection of a logic, but not of any necessity. I hope you will keep that in mind as I go through.

What I intend to do is to touch these steps lightly and say something about the content of each. Then I am going to focus for most of the remaining part of the day on a few of them with those particular aspects that are the most unique, relating to interactive planning. We will try to take out of this the highlights of procedures which clearly differentiate the practice from normal planning. The division here in the six components: first formulating the mess, ends planning, means planning, resource planning, organizational and management planning and implementation and control. Most planning I see is preoccupied at most with these [last] three steps. Very little deals with the others, although I have seen exceptions.

Formulating the mess

What do I mean by **formulating the mess?** It is essentially getting appreciation for the complexity of the interaction and the various elements that constitute the organization, its environment and its parts. Most of my recent work has actually been devoted to developing a methodology of mess formulation. So I am full of all sorts of details and I wish we had time to go into them. I simply will sketch it out for you and give you a framework from which you can frame your own thinking.

Systems Analysis

There are basically three parts to formulating the mess, the **first** is what I call a **systems analysis**, which is nothing more than a very detailed description of how the system actually works. I have never found (in any corporation I have ever been in), that there was available a detailed and comprehensive description of what is going on. Almost every corporation believes it has it, but when you start to pursue it, you learn first of all they say: Well, Joe has it for the production department, Jim has it for marketing, so and so has it for finance. You go around, you collect these various flow diagrams that describe presumably what is going on, and --- I don't know if you have ever had the experience of trying to make them meet each other. You simply can't. I mean, they don't synthesize into a comprehensive work a system picture. So normally some effort is required to get a comprehensive view of what the corporation actually does do, how it is done, what its capacities are, and the length of time taken to do these steps. This is almost always a self justifying activity in that it gives the executives of the corporation a conception of the whole that they never had before. With appropriate thought applied to it, these diagrams turn out to be a great deal simpler than one might expect, and they reveal the essential nature of the business, rather than a lot of irrelevant details. I am not going to linger on this, because there really is an extensive literature on how to conduct systems analyses, particularly in the last five years or so in connection with the development of management

information systems. IBM has a great deal of material available on performance of these and it even has produced templates to enable you to draw the diagrams which represent the way an organization works.

Discrepancy Analysis

It is the **second** part of formulating the mess that is much more difficult to comprehend. It is what I will call the **discrepancy analysis**. This in turn has three parts. The first deals with **inconsistencies**. The second with **conflicts**. The third with **culture**. I'll explain these.

Discrepancies / Inconsistencies

In every organization, there are incredible discrepancies between what an organization believes it is doing and what it is actually doing. With what it says about itself and the facts. It is not at all unusual to go into an organization saying: "We are very decentralized." The chief executive says: "I try to push all the decisions down I possibly can." Then you get down further and talk to the managers and say: "How do you make decisions?" You find out that they won't make a commitment to anything until they have the approval of the top. They say: "I don't have to, but I know that if I don't he will probably change it." So you immediately come across a discrepancy a formal description of how the system operates and how it actually does.

Just very recently I ran across a book which perhaps was more revealing to me of the tremendous difference between how a system claims to operate than any other I have ever read. I am sure some of you have seen it. The book by a New York Times correspondent Hedrick Smith called: The Russians. The book is the result of three years stay in Russia, in which he describes the difference between the way life takes place in Russia, how everyday things take place, and how it is supposed to. The difference between what we call the formal and the informal system, why the differences exist and how the survival of the formal system completely depends on the informal one.

An understanding of that difference is absolutely essential, because those differences are major obstructions to corporate development. There is fortunately a very recent, important body of literature which deals with the analysis of these discrepancies. I will commend to you the writings of Chris Argyris and Donald Schon. There are two books, the first of which appeared about 1974 called: "Theory in practice," and it is particularly part one in that book which deals with the analysis of discrepancies in an organization and the more recent book Organizational Learning of Theory, of Action Perspective. They have focused on the analysis of these inconsistencies, the development of an awareness of them and the effort to remove the inconsistencies by getting a compatibility between declaration or what they called the espoused theory and the theory in use.

Discrepancy / conflicts

The conflicts aspect is to identify the major conflicts within an organization that obstruct its development and conflicts between the organization and external elements. There is nothing new in this concept, but it is absolutely fundamental to understand it. Most of you are aware that one of the principal obstructions to change in any organization are the conflicts internal to it. Peter Drucker once said, with great wisdom, that there is a great deal more competition between the parts of an organization than there are between organizations. Furthermore, it is a lot less ethical. Therefore one has to overcome these internal obstructions because it is always somebody that will get in the way. He will get in the way, because he is out to

get somebody else who is also in the organization. It is not a matter of principle, it is a matter of outright dislike or conflict.

Discrepancies / Culture

We have to understand the lay of the land, the sociological structure of the organization before we get an appreciation of what can be done and what requires being done. I spent time two years ago - on my sabbatical leave in Mexico - working on national planning problems with the Mexican government. After a while I became aware of the fact that the principal obstruction to development in that country as in other underdeveloped or less developed countries that I have worked in, are cultural obstructions. That is habitual ways of doing things, the validity of which are never brought into question. They are simply accepted, as the appropriate thing to do. Their acceptance constitutes the major obstruction to change, adaptation and learning.

To cite a perfectly conspicuous example and illustrate it: In Mexico, I was asked to prepare some papers for Lopez Portillo, who was then the candidate for the presidency, (now is the president), identifying these major obstructions. The first one on my list was corruption. Fortunately, as some of you know, he has made this a major platform of his presidency and has been actively pursuing efforts to convert Mexico from a corruption ridden society to one which will make development possible.

I should explain: Even the very idea of corruption is different in Mexico than it is here. It is not immorally perceived. It is one of the difficulties. It is not that we don't have corruption here, but it is at least something that is hidden and when disclosed is shame. That is not true there, because corruption in Mexico is looked at very much as we look at a tip. In the United States, you go to a restaurant and if the service is good, you give the waiter a tip at the end, which is an expression of your evaluation of the service. The only thing that is different in Mexico is that you give the tip in advance. If there isn't any tip, then there is no service. That is the basic concept. It is an expression of gratitude for what is to come. But what is to come is determined by the expression of gratitude. As a result there is no exchange of service coming out of a sense of duty.

I wish I could tell you some of the stories but let me just mention one so you can get a sense of what I mean. I am not talking morality. I don't care in this instance about the morality of corruption. I am concerned with it as an obstruction to organizational development. One of the most marvelous programs developed in Mexico is a program called CONOSUPO, which is an acronym in Spanish for the national basic commodity agency. This was an agency constructed to set minimum prices on basic commodities like wheat, beans, corn and so on, so that the small subsistence farmer would be able to sell his crop to the government at a price that would allow him to survive. By offering these prices, the private purchasers of crops would at least have to match government prices in order to buy. This was the fundamental idea.

To implement this program, CONOSUPO built thousands of little purchasing stations throughout the country so that every campesino (peasant) was within walking distance or burro distance from a buying station. If you have traveled through Mexico, you have seen them, although you may not have known it. These are the little white cones that sprinkle over the landscape as you drive through the countryside. Each cone is populated by an individual, who is the buying agent of the government. This step is quite simple. He inspects the crop to make sure it meats minimum quality standards. Then he buys and pays for the crop.

When they built these things, they had a major problem. That was how do you get all these people to do the testing and the purchasing. So they did the natural thing. The asked the local political chiefs in each community to nominate a candidate for the

job. The local political chief is called a casique, which is literally the chief. He is almost invariably the ex landowner of the area. He is the man who was dispossessed of his land during the land reform. He came out of it, however, quite wealthy because he was paid for his land. Therefore, he runs the supply store in the local community. He owns the only truck and he is the man who buys the crops, currently, and ships it to market. One number will give you a sense of the nature of the system. In tomatoes for example, in Mexico, for every one dollar you spend on a tomato, the farmer gets one cent. There is a slight markup. The casique does very well. He is precisely the man who was asked to nominate the man to run the government buying station. He did, and in most cases his candidate was selected.

Let me describe how the system actually operates. The poor farmer came to the government to sell his crop for a price that was at least twice as high as what he got last year, because of the guaranteed minimal price. The inspector looks at the crop and says: "I am sorry, you don't meet the standards. I can't buy it." The farmer says: "My God, what can I do?" He says: "That is not my problem. My problem is simply to determine whether you meet the standards, and you don't." So the poor farmer doesn't even unload his stuff. The only other place he can sell it is to the casica. So he goes over there. The casique, by previous arrangement has already been informed that he is on the way. When the farmer arrives, he says: "What are you trying to do? Sell me a crop that isn't good enough for the government to buy? I don't want it!" So the farmer cries, literally. Begs. Finally, under great pressure, the casique agrees to buy it for a quarter of what he used to pay. He does not even unload the stuff; he takes it right over to the government agency and sells it for four times as much. That is what is actually going on.

That is a program intended to improve the quality of life and the standard of living of the campesino. It completely fails, because of corruption. Most government programs suffer in exactly the same way.

Corresponding things take place in corporations. I don't mean corruption, but there are various kinds of cultural obstructions in organizations which prevent their effective operation. One of the more common ones is organizations that have only one direction of communication. Organizations which do not have the mechanism for effective communication in more than one direction are culturally obstructed from development. It is not easy to overcome those obstructions. It is not merely a matter of putting in a telephone, but it is changing attitudes so communication can go in the other direction. It is through an understanding of the inconsistencies, the conflicts and the culture that we can get some understanding of the discrepancies between fact and belief, which must be dealt with if an organization is to develop effectively.

Reference Projection

The **third** part of this process, formulating the mess, is the one I want to linger on a bit because this really does deviate from what is normally done. This is the use of something that is called **reference projections**. I am going to try to explain what this is by example. Then come back and talk about why they are done. It is easy to say what a reference projection is but saying so does not help you understand it very well. A reference projection is an extrapolation from the past, which is based on two assumptions that are known to be false. The first assumption is that the corporation is not going to change any of its policies. It is going to operate exactly as it has in the past. The second assumption is the environment is not going to change in any surprising way. It will simply continue all existing trends. Under those two assumptions you extrapolate the future. Let me point out this is not a forecast. Because the assumptions are known to be false. It is something, but what it is we will see in a moment, and I'd like to give you an example.

An example

In 1959, we were doing some work with the Ford Motor Company in their credit and insurance division, and while working there, we got to know the corporate planners quite well. Ford had just completed an incredible plan out to the year 2000. They asked us to take a look at that plan and produce some comments on it before it was submitted to the board, which we were delighted to do. It happened that by sheer chance, at the same time, we had a contract with the Penn/Jersey transportation commission, which was a special authority set up by the federal government to study the transportation needs and to plan for them for the Delaware valley area, which is the area around Philadelphia covering approximately 16 million people in 8 counties, for the years 1975 and 1985. That was 15 and 25 years out. So, simultaneously, by coincidence, we were studying two interrelated plans. One of a transportation authority, the other one of an automotive company.

We were struck by a common assumption made by both plans that was never made explicit. So that when I came back to the Ford people, I asked them, I said: "You know, the plan is very impressive and all the rest of this stuff, but there is a very fundamental assumption you make that seems to us to be questionable." They said: "Like what?" We said: "You assume the automobile will undergo no major change between now and the year 2000." Exactly the same thing had been assumed in the Penn/Jersey transportation study. That there would be no fundamental changes in the car. Of course there would be design changes and model changes, but the automobile you would recognize. If you were Rip Van Winkle, woke up in 1985 and saw one, you would say: "That is an automobile." We decided not to debate the issue.

We went back and did a little work. I will describe that work. It is in the literature, by the way. **This is an example of a reference projection**. I called some friends at the US bureau of the census, where I once worked for a while, and asked them for the best forecast they had of the population of the United States in the year 2000. They told me they had three forecasts going out that far. The high, the medium, and the low. I said ok, I want to be conservative. Give me the lowest level that you think the population of the United States can reach in the year 2000. They gave it to me. So I now had a number, which is the population of the US in the year 2000. I said to my friend Leon Pritzker: "Leon, can you tell me what portion of that population will be old enough to drive?" He said: "That is almost impossible. Every state has different laws and they keep changing." I said: "You don't have to worry about the changes. Suppose the current laws continue. Then, given this population estimate, how many of them will be old enough to drive?" He said: "We could find out." So we signed a small contract. They went to work. It took about 2½ weeks for them to run it off, at the end of which they told me, for this forecast, what was the expected number of people of driving age in the US, in the year 2000.

Next question: How many automobiles will there be? The American association of automotive manufacturers maintains data, starting in 1920, on cars per capita. So we took the data on the cars per capita, from 1920 out to 1959. We left out '42 to '46 for obvious reasons and plotted the number of cars per capita. It was a fairly linear relationship. Then we simply took it, fitted a line and extrapolated out to the year 2000. That simply said: If current trends continue, that is how many cars there will be. You may be interested in the result. It turned out to be 1.54 automobiles per driver. That is a lot of cars. Fortunately, an article had just appeared written by the principal transportation consultant in the United States, [Vorhees?] from Boston, in which he had argued that there was an upper limit. You couldn't have more than one car per driver in any country. So we said, what the hell, let's cut it down. We rounded it off to one. So now we had an estimate of the number of cars.

Next question: How many miles per year per car? The American institute of petroleum maintains figures of miles per year per automobile, again from 1920 on.

We plotted it out, extrapolated it out and it turned out to be about 13,000 miles per car per year. A very slight increase. About 1,000 miles over the period. How many of those miles would be driven in cities and how many between cities? We discovered that the Highway Research Board publishes annual statistics on the breakdown between intra- and inter-urban automotive traffic, so we got the percentage, and extrapolated it out. It turned out to be 62% in the year 2000 in cities. So we multiplied the 62 by the 13,000 by the number of automobiles, and that gave us the total number of automobile miles per year in urban America in the year 2000.

Next question: That clearly was a number of miles that could not be accommodated within current streets and highways. So the question was: How many additional lane miles for streets and highways will we require to meet that demand? Well, that depends on how much congestion you are willing to tolerate. It turned out that in 1959, we were already above what is called the practical capacity of urban streets and highways, but below the theoretical capacity. The theoretical capacity (I am simplifying slightly, but not much) is the number of cars you can get on a highway if you use it as a parking lot. The practical capacity is the largest number of cars you can get on a highway with them all moving. We were clearly over that, because if you go on any of the turnpikes at peak hours, you don't always move. So we said: Look, people are already tolerating the current level. Therefore, let us maintain the current level of congestion. How many additional lane miles of streets and highways will we need? By the use of queuing theory, it was possible to set up the equations and calculate. It turned out to be something like 58,000 lane miles.

How much does it cost to build a lane mile of highway? The Highway Research Board had figures on this. But they told us to be careful because they were inflating tremendously. We said no, we don't care about inflation, just tell us the highest price that you paid last year for a lane mile of street and highway and we will assume that it will remain constant from there on. They gave us the figure. It was about 10 million dollars per lane mile. Most of this goes into the cost of real estate, not the cost of construction. So now we took the cost and multiplied it by the lane miles. It gave us the total cost of maintaining the current level of congestion assuming, as the automobile companies did, that the automobile would remain essentially the same, continue to grow as it has in the past. That told us how much would have to be invested. Then we divided that number by 40, because this was 1960 and we had to go out to the year 2000. That turned out to be 18.4 billion dollars per year. That is a big number, but you may not realize how big it is. Because the most the United states has spent in any year for all forms of urban transportation is 1.4 billion.

Therefore the implicit assumption in the planning of Ford and the Penn/ Jersey system was that the United States was going to multiply by more than 12 its annual expenditures for the next 40 years. We did not think that that was likely. But there was something even more disturbing. Because if the United States did spend this money, by the year 2000, we would have paved 115% of the city surface.

Reference Projection Conclusions

That is what a reference projection is. What is it? It is a forecast of what cannot happen. It is made for indicating where the system will destroy itself if it continues to operate as it has in the past. Where are its inherent breaking points? Therefore its function is to focus your attention on the central problems of the system. To identify where it is most vulnerable unless modified.

Another example

To give you a rather quick example, some work we did for one of the districts of the Federal Reserve Bank. An analysis of how labor is spent in the bank revealed that the most labor consuming activities in the bank is clearing checks. We managed to get data from 1953 to 1973 on the number of checks cleared per year in the Federal Reserve system. We plotted that and extrapolated it out to the year 2000. (We were dealing with the fourth district bank, which is headquartered in Cleveland, Ohio). That gave us a total number of checks to be cleared. We then studied the number of checks cleared per day by a check clearer. That turned out to be constant over the years, so we now could calculate the number of check clearers. We then determined the number of square feet required for a person to clear checks in. We took the number of check clearers times the number of square feet, and that told us the amount of office space we needed. It turned out the city of Cleveland was not big enough to hold it. If they occupied the whole city of Cleveland they would not have enough space to clear the checks in the year 2000. That was not a forecast of what was going to happen. That was a forecast which showed that unless something fundamental were done to the check clearing system, the Federal Reserve system would not survive. They took steps that you are probably aware of and this led to the introduction of the electronic funds transfer system, which was initiated in the Cleveland district, which will change that situation.

The reference projections are extrapolations from the past into the future, based on the assumption that there will be no fundamental changes to identify the critical points at which a system will break down. Is that concept clear? If not, please question me about it.

Summary

Once these three things are done, this analysis of a system; the description of how it operates; study of the discrepancies and the reference projections, you are normally in a position to have some appreciation for the nature of the mess and can begin to formulate it as a system of interrelated problems. There are many formats in which this can be done. The most useful one we have found is to write a scenario, which describes the mess, by looking at how it will look five and ten years out unless there is intervention in it. That makes it look a little less critical, but one is trying to deal with the current situation, at the moment. There are all sorts of ways to present it. But basically it is the appreciation of the interaction of the set of complex problems, that constitutes the situation within which planning has to be done. This is seldom completed before the other phases of planning begin, but it is the one I have to talk about first.

Ends Planning

Let us take a look at **Ends Planning**[2], which is where the core differences between interactive and other types of planning takes place, in this aspect here. Ends are of three types: **Goals, Objectives, and Ideals**. One can define these however one wants, but we have found it useful to distinguish between them in the following way: If we take a chart of time, running from now out into the future. In any planning process, you have some period in mind that you are covering. Normally it ends at what is called the planning horizon. It does not have to be a specific date. It is some period. I have never seen a corporate plan, for example, extended beyond the year 2000. They usually think in terms of five years, ten years, 20-25. Something like this. Whatever the horizon is, this is the period planned for.

A **goal** is any outcome which is desired, the attainment of which is expected during the period planned for. It is something which you expect and intend to attain during this planning period.

An **objective** is a desired outcome, which is not expected to be obtained during the period planned for, but is believed to be attainable subsequently, and towards which progress is possible during the period planned for.

So your vision is that this is something that is going to be obtained out here, but you can be making progress during this period of the plan. These are the objectives. These are the goals.

Question: Is there a general agreement on those terms in the planning community?

Answer: No, the public community is reversed. You find in public planning it is exactly the opposite. They use objectives where I use goals and goals where I use objectives. In the business community, which uses sports analog all the time: The team winning the game. See, winning the game is the objective, the goal is prior to it. So, I don't care. You can reverse them if you want to, but the distinction between the two ideas is important. The terminology is arbitrary. But you will find in the public planning literature these two are reversed.

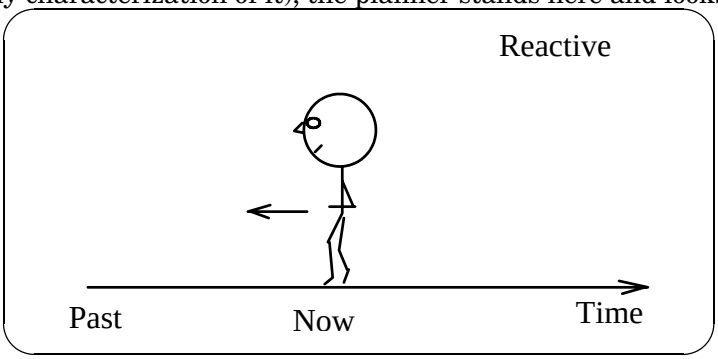
It is interesting to notice, if you go back to reactive planning, the first type we talked about, it focuses on goals. Never deals with objectives. If you look at preactive planning, you will find that it focuses on objectives, as well as on goals.

Question: Would you please define objective again.

Answer: It is something you don't expect to obtain during the period planned for. It lies beyond it, but you do expect to make progress towards it. Let me give you an example. You are a company with 15% of the market now. You would ultimately like to have 50%. Over the next five years, which is your planning period, you expect to go 25%. This is your target, or goal. You expect to obtain it over the period planned for. This (50%) is your objective, and you expect to make progress towards it. So a goal is always a means to an objective. It is intermediate to an objective.

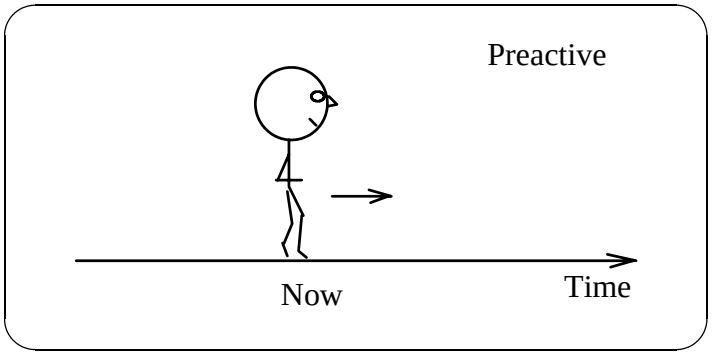
An objective, as it will turn out, is intermediate to an ideal, which is the third element. An **Ideal** is an objective which can never be obtained in principle, but towards which progress is always possible. For example, it is one of the ideals of mankind to move with infinite speed. We will never be able to do so. But it will always be possible for us to go faster. It has been an objective in science to reduce observational error to zero. We will never succeed, but we can always reduce the error due to observation. That is an ideal. It is only in Interactive Planning that Ideals play a very central role. I am going to show you how in a moment.

I am going to make one other point before we take a look at them and the role which they play. In Reactive Planning, (again if we take this time axis and here is now, you go back to my characterization of it), the planner stands here and looks at the past.

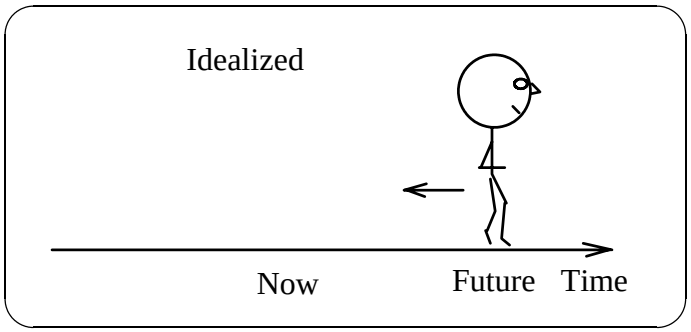


He says, that's pretty damn good, this is pretty bad, and he moves into the future facing the past. As a result he has a hell of a good view of where he has been, but none of where he is going. As one commentator once put it: "A reactive planner is a man who drives a train from the caboose." It is a very good image. He can't see where

the front of the train is or where it is pointing, but he can see where he is coming from.



The preactive planner is standing over here, but he is facing the other direction. He is looking out as far as he can and he is trying to prepare for this period out there. He is walking into the future, facing the future.



Now you are going to see a very curious thing happen, when we come and talk about this third type of planning, because this is going to walk backwards from the future into the present. We are going to have the planner out here, walking backwards into the present so he is always facing the future. That is a very, very different posture. All that requires explanation. The key to this type of planning lies in this next operation.

Idealized Redesign of the System Planned For.

My first encounter with this idea was a very dramatic one. I would like to take a minute or two to describe it to you and then show you how the ideal was generalized subsequently. In 1951, I had a collaboration going with an old friend by the name of Peter Myers who was a solid state physicist, working at the Bell labs. Once a month I used to go to the Bell labs to spend a day with him, and once a month he would come out to Case institute, where West Churchman and I were located at the time and he would work with me.

I got to his office for one of these visits one day, and as I walked in he said: “Russ, something terrible has happened. I got here early this morning and had a message which told me that I had to go to a meeting this morning which the Vice President in charge of the lab has called of all the section heads. (He was in charge of solid state physics there at the lab). I’ve got to go. I don’t know what it is for, or how long it is going to last. Will you be able to occupy yourself while I am gone?” I said: “Sure, don’t worry.” So he seemed a little relieved and he started to leave the room and then he stopped when he got to the door. “Wait an minute. They did not say I could not bring a visitor. Why don’t you come along with me. We’ll see what happens. I they frown on

it I'll give you a signal and you get up and leave. Otherwise you sit and see what goes on at the meeting." Being bashful, I reluctantly agreed and went to the meeting. There were about 35 section heads in the room. The Vice President was not there yet. When everybody was there, he finally walked in, in one of the most dramatic entries I have ever seen. The man was absolutely morose and solemn, serious. He walked up to the front of the room. He just glared. Almost aggressive. Then he said, when it quieted down:

"Gentlemen, the telephone system in the United States was destroyed last night." Everybody looked at him. They looked to each other. One or two guys went like this, leaned over and said: "He is crazy. I just came from a talk on my telephone. What the hell is going on." He let the murmuring go on. It went three to four minutes, then it quieted down. He said: "I know what you are saying to each other. You think I am crazy. You just came from using the telephone system. You are wrong. You did not. You better believe it. Because your ability to remain with this organization depends on your believing that the telephone system was destroyed last night." Now they looked at each other. This guy is not only crazy, but he is dangerous. Buzzing in the room again. He waited until it quieted down. Then he took a relaxed posture. "By now you are convinced I am crazy. You deserve an explanation. OK, let me give it to you.

I have been concerned about a problem in this laboratory for some time. I am going to take you through my thought process. What would you say are the three major qualitative changes to the telephone system since its invention? What have been the three major changes to the telephone system?"

There was no hesitancy on the first one. Everybody yelled out the same thing: The dial. They said that was a major change in the system. He said: "Right. I agree. When did we install the dial?" This is, remember, 1951. There was some argument about this, but they all agreed it was in the 30's somewhere, and he gave them the date. It was something like '34 that they started. Fine. He said: "When was the dial invented?" There was a hush. Nobody knew. So they guessed. Nobody was even close. It turned out to be 1892, that the dial had been developed. "OK, so let us take the next one."

The next one was the coaxial cable. Same thing. Turned out that had been developed in the 19th century.

The third thing was what they call multiplexing. Sending multiple messages over the a wire simultaneously by sampling the messages. It turned out that had been developed in the 19th century.

When these three points were out he said: "Doesn't it strike you as curious that here we are, the most famous industrial laboratory in the world. More spent in this laboratory than in any other laboratory in the world. And every single major qualitative change in the system that we are researching on was made before we were born."

"We have not done a damned thing. Why? We have been busy as a devil. Why? We have been so busy correcting deficiencies that we have never answered the question of: What do we want?"

Then he said an incredibly wise thing: "*We can get rid of everything in the world we don't want, and still not have what we do [want].*" He used a marvelous example: He said: "How many of you saw a lousy program on TV last night?" Almost every hand in the room went up. "Great. What did you do?" They said they changed the station. "Did you get what you want?" Most of them laughed. You can get rid of a program you don't want, but getting one you do want is a very different thing.

"It occurs to me that the basic deficiency in what we have been doing is that we have operated on the assumption that if we identify what is wrong with the system, the

deficiencies, and direct our efforts to removing them, we will get the system we want. That is wrong!"

"Therefore, I want to start with the question of what system do we want. Ergo: The system was destroyed last night."

"For the next year, we are going to design the system we are going to replace that one with and there will be only two constraints placed on that design.

Number one: The new system will have to be technologically feasible. I don't want any science fiction. If you want to use a laser beam, ok, we know that is possible. But don't use mental telepathy, because we don't know that is possible. You can invent like mad, but you cannot create non-existing technology. Is that clear?" Yes, that was clear.

"Number two: You do not have to worry about how we ever get such a system. But the system that you design must be capable of surviving if it came into existence. It must be an operationally viable system. It must have the capacity to survive. They are the only two constraints. The system must be technologically feasible and operationally viable."

The rest of the day was spent in organizing to take on that job. My friend Pete Myers got assigned to one of the work teams, that I had the pleasure of working with over the next six months. It could not have been a better one. It was the team that got the job of the hand telephone. The set that you just normally use. And our task, coordinated with that of other teams, was to ask the question: If there were no longer any telephones, and we had to design the telephone from scratch to use, what properties would it have? We had our first meeting the next day. I can remember that meeting very clearly. It was after a little discussion we said: Look, before we start designing anything, why don't we list all the characteristics we would like the telephone to have ideally. I can remember the first suggestion. The first suggestion was to get rid of the goddamned wrong numbers. A good system, an ideal system, would not have wrong numbers in it. So we listed: Eliminate wrong numbers. I remember the second suggestion even more clearly, because I made it. It was: I want to know who is calling me before I answer the phone. So I have the option of not answering. So we listed that. Third: When I am talking on the telephone and somebody else is trying to get me, I want to know that somebody else is trying to get me. I want to know who it is and I want to be able to give a message to him without stopping the conversation I am in. We listed all these things. We wound up with around 40-45 such suggestions.

Let me just take one of them and show you what happened. We took the wrong number one. We said: "All right, now how do we design. Because our problem is to design a system that will eliminate the wrong numbers, that is the objective." The first question that occurred to us is this: There are two kinds of wrong numbers on the telephone, actually three, but two basic ones. One is we have the right number in your head and you dialed it incorrectly. You dial 45 instead of 54. The other one is you have the wrong number and you dial it correctly. Then of course you can have the wrong number and dial it incorrectly and very remotely, you might get the right number.

The first question was: What is the relative proportion of wrong numbers of each type. We had no idea. But Bell labs has a marvelous psychological group that is headed up by Carlin, a great applied psychologist. We called him and said: "Hey, have you ever done any work on this?" We described it for him and he said: "Sure, what do you want to know?" "We want to know the relative proportion." "Sure. That is easy." As I recall, something like 81% of the wrong numbers are when you incorrectly dial the right number. Overwhelmingly. Rather than the wrong number correctly dialed. So we said: "OK, let us just focus on the right number incorrectly

dialed. How can we eliminate it?" Well, in about a half hour, we figured out a way to do it in principle.

The way to do that, we said, is as follows: Suppose we take the telephone, but instead of a dial here, we put push buttons. We will have a series of buttons. Let us put a register over here. Now, when you come to this telephone, you don't lift up the hearing part. You dial by pushing the number you want to call, and it shows on this register. If that is the correct number, that you intend to call, then you pick up the receiver and your number goes through. That will completely eliminate the incorrect dial of the right number. Because if you put the wrong number in, there was then a clear button here. You would just simply hit that button, clear the number and start over again.

The question was, was that technologically feasible? That was a requirement. So we called the engineers. They sent two people over reluctantly, because they were busy working on something else. These two guys came into the room, and we went through all this, explaining this great idea we had. These two guys never said a word. But they kept buzzing to each other. We stopped and waited for them to say something. They just looked at each other. Finally they nodded, got up and left the room. We could not figure out what the hell was up. One of us chased them down the hall, but they completely ignored him. So, we said, all right, we just will have to try somebody else. We don't know what is bugging these guys. We went on to another subject.

About two days later, these fellows reappeared with a smile on their face and said: "You must think that we behaved a little peculiar. You don't know what you did to us." "What do you mean, was the idea that good?" "Oh, the hell with that, that is not what is interesting. But that idea of the buttons was very interesting. It occurred to us that maybe it takes less time to put a number into a telephone by using buttons than by using the dial. So we have been running some tests. The amount of time we save will increase the capacity of the telephone system by 20% without any additional equipment. So we initiated a project to produce a push button telephone. That was the origin of the touch tone telephone. It came out of that process.

Every major change that has occurred in the telephone system and is contemplated from now to the end of the century came out of that study. It was done in one year. In case you are curious, by the way, there is a telephone in operation now, in one part of the country, in which you have, when you go to the telephone, the number of the incoming call shown on a register at the bottom. It gives you the telephone number of the location from which the call is coming. It does not give you the name of the caller, but it does tell you the station number. It has this register here and has a little red button up here which flashes on and off when you are talking on the phone to tell you that someone else is trying to get you. It has a series of buttons under this red button with precoded messages. So I can push the top button and it says: "Hold on, I am on the line right now, I will be right with you." You never have to stop the call. The other on says: "Hang up. I have your number. I will call you right back." Those phones are all in existence today.

What is this process we have just talked about? This is what I mean by **idealized redesign**. You take the system, that you are going to plan for, and assume it was destroyed last night. You now confront yourself with the following question: What system would I replace it with, if I can replace it with any system that I want. Now. Not the year 2000. Right now! Subject to only two constraints: That it be technologically feasible and operationally viable. That is what we got out of the Bell experience.

But we had to add something to it. The first concern is: Isn't that utopianism? Of course it is. It looks very much like utopianism. It turns out it is not, because of three additional requirements that have to be imposed on the system.

If you go through the process of redesigning a system in this way, and having done so, put it aside to come back a year later, what do you expect will happen. Do you think you would be completely satisfied? No! **Your concept of what is the ideal is constantly changing**. Therefore, the design must be subject of continuous revision by the the people who design. That is not utopia, because utopia is a statement of perfection and to admit that the designers are going to change their mind is to admit that the system is less than perfect. So this must be a part of a continuous planning process. That is **number one**.

The **second** requirement is to do it. **In the design of such systems, there will always be issues that arise for which you have no objective basis of making a decision**. For example, I want to take a very simple one which everybody will appreciate. We just recently published (a year ago), the results of a study we made for the government on a national scientific communication and technology transfer system. A big mouthful. It has an acronym called SCAT. The book is called the SCAT Report. It is an idealized redesign of that national system. When we were doing that, we ran into all sorts of fundamental questions we could not resolve. For example: Should all articles submitted to journals be refereed? Believe it or not, there is no literature that is relevant to the establishment of the desirability of refereeing. We do not know if it does anything of value or not. What do we do? Toss a coin to make up our mind or just decide what we might like if we don't have any objective basis. No.

That is the second essential characteristic of an idealized design. You do not have to resolve every design issue. But what you do have to do is design into the system, an ability to resolve the issue experimentally. That is, you must design into the system the capacity to learn how to improve itself. How is that done in fact?

Just to give you a feeling for it: In our design, we require that one third of every technical journal consist of articles selected at random from those submitted, which are published without referee. There is no designation to the reader which these articles are. Now we have a system of feedback where the readers, evaluate each article they read. If at the end of the year, in the evaluation of a journal, we find out that there is no difference between the quality of the refereed articles and the unrefereed articles, then you eliminate refereeing. Or, if the unrefereed articles are better, you eliminate it. If on the other hand, the refereed articles are consistently evaluated as better, then for that journal, it will publish only refereed articles there. There are two things about that kind of thing. The system will learn which is the best. Furthermore, you don't impose a single rule on every journal. The decision is made for each journal as a function of its own performance. That is designing experimental capability to resolve an issue into the system.

Finally a **third** characteristic, which has to be incorporated into the design is this: **One thing you can be sure of is that you cannot anticipate all the environments that any system you design is going to have to operate in**. There will be unexpected events. Therefore, you must design into the system, an ability to identify the unexpected and to adapt to the unexpected changes. The capacity to and maintain its quality of performance under unexpected conditions.

None of those three things are required in the design of the utopia. When Plato designed the republic, it was a statement of perfection. There was no improving it. To talk about a utopia learning is nonsense. It is already perfect. What does it have to learn?

Therefore, the product of an idealized design is not an ideal system. It is the best ideal-seeking system that we can find. That is the point of it. It is a statement of the best system we can think of for the pursuit of ideals that we can imagine at the present time, subject to revision in light of subsequent experience in the pursuit of those ideals.

What we are going to do now is look at why one bothers to go through that and how it is used in the planning process, because it is the absolute foundation of interactive planning. Its role in interactive planning corresponds to the role of forecasting in conventional planning. It is not a forecast of the future that dictates the nature of a plan. **It is the design of a desirable future which dictates the plan**.

Before we go into that, I would like to pause and give you a chance to have at me about anything I have said up to here. Reference projections, idealized design, or any of this.

Question: "How do you design in the capacity to meet unexpected events in the environment, if you don't know what these events are going to be?"

Answer: What you need is a surveillance mechanism, which essentially tries to make explicit the assumptions on which you are always operating, even in an ideal state. What are the things you are taking for granted, which justify your current strategy? It is constantly examining the environment for the validity of those assumptions.

For example, you may assume that the ratio of advertising to gross sales in your industry are going to remain within the bounds that they have remained in historically. That may be an implicit assumption you have made. If one of the companies in the industry suddenly breaks that and you have not been aware of that fact, it can be disastrous.

I can give you an example of that. The entry of Millers in the brewing industry when they were bought by Philip Morris, led to a violation of that assumption. You know what happened to Millers. They moved from eigth to second position in five years. It took three and a half to four years before the rest of the industry knew what the hell had happened and by then it was too late to respond effectively. But you have an ability to detect that kind of thing immediately.

Systematic surveillance of the environment can detect aberrations from normal behavior. I'll give you an example in the same industry just to help a little bit. Such a system existed in one of the brewing companies. One of the most incredibly stable series I have ever seen in my life is the gallons of alcohol consumed per adult per year in the United States. It turns out that that quantity from the end of prohibition till 1963 never varied from one year to another by more than one 1/100th of a gallon. Isn't that incredible! In 1963 it went up like mad. This system detected that. It did not know the explanation. It took a year and a half of research to find out why. They were the first ones to find out why. Others admitted something was up, but they did not know what it was. It turned out it was due to a redistribution of discretionary income it this country. It was a major redistribution of discretionary income. It had a major impact on the consumption of liquor. In enabled them to change all of their estimates of consumption and had major strategic consequences for the company. They had to change all their plans. That is the kind of thing. Does that direct itself to your question?

Question: "Are you going to later talk about how you sell one of these idealized redesigns."

Answer: Well, I will attempt. You know, sell it. The people you think of selling it to are the people who have done it. Remember we were talking about participative planning.

Question, continued: "I am talking about acceptance, say by top management, of what the committee redesigns."

Answer: Let me just say a word about that now, because this is always a very delicate problem. Operating out of the university, my problem is a little different than the problem of people working inside companies. Because fortunately, there are

many more people who want to do this kind of planning that we are talking about than there are people who do it.

The problem is in selling. It has not been sold. Never has been. The problem is to get the work done. Somebody always says: "Well, that is fine for you, because you can pick and choose and there are people who come to you. What do you do when you are inside a company?" Well, that depends on what you consider yourself to be. Do you consider yourself first to be an employee of the company and secondly one who does planning for them? Or do you consider yourself to be a professional planner who happens to work for that company?

Now, the question of what is a professional. A professional is a person who establishes work standards that have priorities over any other considerations in the conduct of his activities. Therefore, if you are a professional planner in a company that wont do the kind of thing that you consider to be required, what do you do? The answer is perfectly clear, if you are a professional. You may not like it, but it is clear. You get the hell out!

If you laugh at that, you see, and you say: "You know, that is easy to say if you want to." Yes it is. You don't have to accept that. But then you must accept the fact that you are not basically a professional planner. You are an employee of the company who is engaged in planning. There is no escaping that dilemma. And you can't confuse it.

There is nothing wrong with being an employee of the company first and a planner second. But there is something wrong with claiming that you are a professional planner if you will sacrifice what you consider good planning in order to remain an employee of the company you are with. That is a fairly tough answer. Well this is true.

(Stretch break).

Let us continue now with interactive planning, its characteristics and practice, and then finally wind up by saying a few things about the other phases of planning. Then hopefully, we can use the remaining time for any questions or discussion you might like.

It is quite natural, after hearing the description of the idealization process, to ask: Why in the world would a group of responsible managers - executives - sit down and engage in such a ridiculous exercise as asking themselves what they would do if the system that they manage were destroyed. The reasons are not readily apparent, so I like to discuss them with you and give you examples as we go along of each of the points in practice, which support the various reasons. Some of these will reflect back on points that have already been made, such as the first one.

The **first major reason** for engaging in idealized planning **is its impact on participation**. There is a very critical relationship between the two. A few years ago, we were engaged (as I referred to) with the Fourth District bank of the Federal Reserve in planning of the banking system of the United States. When one thinks about a subject like that, the first thing one says is: "Oh, my God, I don't know enough about banking!" I certainly did not. So, what you want is to look for the experts to come in to do the planning. As a result, in any given area, you immediately develop a concept of an elite who are qualified to do planning for that area. If it is going to be transportation, it had better be transportation planners, people that understand the transportation system. Banking, the banking system. Oil, the petroleum industry. And so on.

Therefore, the normal concept of planning is already an elitist concept that precludes participation. The interesting thing is that when instead of: "How we ought to plan for a bank?" we ask the question: What ought a bank to be? Then nobody is an expert. Arthur Burns (Chairman of the Federal Reserve in 1978) does not know one

damn bit more than any of you do about what a bank ought to be. He may know a great deal more about what it is, what it can be, what it cannot be. But nothing more about what it ought to be. Your opinion is as relevant as anybody else's. Therefore, in the idealization process, everybody's opinion is relevant and important. That does not mean that everybody does the same thing. Let us take a specific case and look at it and see what actually happens. The largest corporation in Mexico is one called the Monterey Group. It is headquartered out of Monterey. It is a holding company that has incredible holdings. It is large by American standards. One of its very large components is Cerverceria Cuauhtemoc (pronounced 'Clecdema'), which is one of the major breweries in Mexico.

They instituted such planning a number of years ago, of a completely participative character. It went all the way down to the bottom. The janitors were organized into groups to do idealized redesign for the corporation. The messenger boys, the secretaries, everybody in the corporation had an opportunity to participate in that design. What they did was entirely different.

At the top level, the Executive Board, the Chairman of the Board, the President and the Senior Vice Presidents were sitting up there worrying about such problems as corporate growth, what kinds of diversification, acquisitions and development they ought to be in. How are they going to finance? Are they going to use equity financing? Are they going to use the bankers? Are they going to go to the money market? How are they going to develop the necessary managerial personnel that are required? How are they going to deal with the government? Questions of this sort.

The janitors were not asking those kinds of questions. Hell, they did not even know what debt to equity ratio was. What do you think the janitors worried about? They were asking questions like this: How do we design the facilities in this company so they will be easier to keep clean? Specifically, one of the interesting questions they got into was: How many lavatories should you have, where should they be located and how ought they to be designed in an ideal corporation?

Now, the first reaction is: That is ridiculous! We can understand why you need the executives worrying about diversification, but why do you need janitors worrying about cans. Well, ask yourself the following question: Supposed we stopped the executives from thinking about diversification. How long would the corporation continue to exist? The answer is: A fairly long time. But suppose you eliminate cans. (Laughter) Every part of the whole is relevant, but that is not the point.

The point is this: When the janitors completed their conception of the ideal corporation, which was almost all focused on sanitation, cleaning, health, things of this sort, they were brought together with the group of workers in the plant who had simultaneously been their conception of the ideal corporation. All of which had to do with the production process. They were brought together to share the ideals. They looked at them. Then they discovered a very curious thing. The janitors discovered that when they had designed the plant, to maximize the ease of keeping it clean, they had neglected to provide the space that was required to produce the product. A slight oversight. On the other hand it turned out that the production workers had forgotten all about the sanitary facilities. They had provided absolutely nothing for that. And they showed their scenarios (to each other), and they laughed.They looked at each other and said: You know, we are really stupid. They said: We had better form a joint group and together combine these two pictures. That was the point. Because now they began to learn. They began to understand the role of the others in the organization.

When they were finished, they were brought together with another joint group that came out of quality control and general supervision and they had to go through the process all over again. And in that process of successive examination of interaction of the part of the system they knew well with the others, **they began to understand**

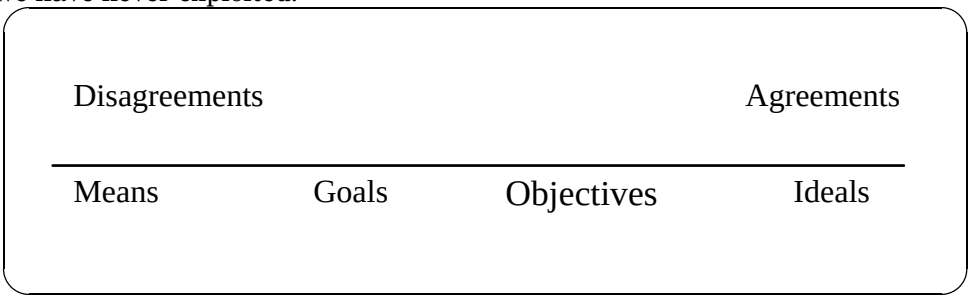
every single one of them, how the system as a whole operated. It is out of that that the principal benefit of planning derives.

Remember, we started off by saying the principal benefits of planning derive from engaging in the process and not from consuming its product. Now we can say why. **The effect of participation in the redesign of the corporation is that it provides each member of the corporation with an understanding of how what he does affects the performance of the whole**[3]. It provides the basis with which he can make more effective decisions whatever level he is at from the overall organizational point of view. That is where the payoff comes. When everybody in the organization is aware of the impact and the interaction of what he is doing with what others are doing, so they are made not from a point of view of not what is best for the part, but what is best for the whole.

So there is an incredible educational process. The education is two ways. I mentioned during the break that in the same company, people were not necessarily confined to dealing with the part of the company they knew the best, they were able to wander wherever they wanted to. There was one group of secretaries who worked in the executive offices, who for some reason or other decided to talk about the ideal product line for the corporation. So they redesigned the product line. Included in their redesign was a suggestion for a new product. When the executive board read it, they simply came out of their chairs. Six months later they introduced that product. It was the greatest innovation in the history of the corporation. It was a suggestion made by a secretary. There are incredible ideas all through the organization, which never get normal expression.

The unbelievable experience in that corporation went something like this: At the bottom levels, they prepared their scenarios, each one their idealized designs. These [ideal designs] were gradually fused together and worked their way up into the corporation. We had our first large meeting in the corporate planning group, which was going to produce the first large synthesis. [This would be] a comprehensive design of the total corporation, using as inputs all of these several hundred scenarios that had been prepared throughout the corporation. That meeting started about nine o'clock in the morning and there was a coffee break around eleven. When we opened the door to the board room to come out of there, the hall was lined with messenger boys, secretaries, janitors, truck drivers, and everything. Just lined the hall. As the door opened they all shouted: What happened? Can you imagine a corporation in which people at this level are standing outside the board room waiting anxiously for word on what happened in the corporate planning meeting? Well, it is perfectly clear why. They wanted to know what happened to their ideas.

They were that much involved and that leads to the **second essential property of the process**. This process, for curious reasons that are very important to you, **generates a consensus that is lacking in most organizations**. A sense of the whole. There is a curious thing about man which some psychologists have recognized but we have never exploited.



If you take this scale, from means down here, these are the things you do, to goals here, to objectives here, to ideals here, it turns out that most of our disagreements

occur at this end of the scale. That the more general we become, moving out here, the more agreement there is among people. Most of our arguments are down at this end, because we normally enter into discussion down at this end.

This reverses the process. It turns out that people that you would think would never agree, surprisingly agree when we come out to this end. It is the recognition of that fact that has an incredible impact on an organization. Why? Because once they realize that there is agreement out here, you have created a psychological base for negotiating the differences in the intermediate points.

If in addition, you provide a methodology, as you do in idealization, for designing into the system an experimental capability of resolving issues, you don't have to settle the issues. All they have to do is agree on what is a fair test, not what is the right answer. Out of these two things you generate consensus.

I know the next thing is going to be inconceivable to you, but it is absolutely true, and it is a matter of record. I will tell you later about one of the most exciting projects we ever worked on, which was the development of a long range plan for the city of Paris. It was done in '73 and '74 for Pompidou. That plan went to the cabinet of France over the signed support of the twelve major political parties of France without a dissent. It is the first time in the history of France that ever happened. Absolute agreement among the major twelve parties of France on the plan. How come? Well, I'll tell you more about that in a few moments.

Consensus generates commitment, which is the third factor. When this type of planning really works, it converts planning into a crusade. It makes a social movement out of the organization. It is an indication of commitment to ideals that enriches the life of everybody involved. Then it becomes more than a job. This is something that Churchman was talking about (in the lunch address); a place really comes alive and bristles with involvement and activity and excitement.

There was a major oil company that we had begun to work with and they were very cautious about entering this area. The Chairman of the Board was a very forward looking man. The rest of the managing committee, consisting of the President, the Executive Vice Presidents were very conservative and hesitant. But under the Chairmans leadership and also power, they agreed to take a first step. The first step they agreed to was this. There were eight members of the managing committee. After several meetings in which we discussed the nature of idealized design with them in some depth, each one agreed, on his own, to do his own idealized redesign of the corporation. But they were to do them completely independently of each other. Then they were to send them to us at the university and we were to do two things. We were to distribute the things so everybody had a copy of everybody else's, and then we would meet to discuss them and out of that we would produce a synthesized version. I.e. we would try to bring the eight together into a single version. Then all went ahead according to schedule. They were given about six weeks to do this. They did. They sent their idealizations in, we redistributed them, and we came out for the meeting.

We got there a little early and I went into the office of the Chairman of the Board. He was an old personal friend I had known him for many years. As I walked in he said: "Goddamnit Russ, I've got to show you whatever happened to this corporation!" I said: "Boy, I am glad to hear that, but why?" - "It is just incredible!" - "What is incredible?" - "I could not believe it!" - "What could you not believe?" - "The managers in this company are marvelous!" - "Did you not know that?" - "No, sure I knew they were competent, but I had no idea how good they were." - "What made you change your mind?" - "Hell, they all agree with me!" (laughter)

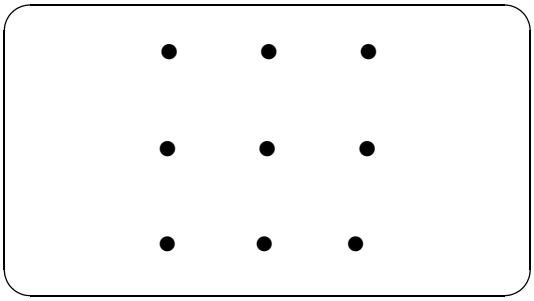
When that meeting was held, the major element of discussion was the overwhelming surprize of these people that their idealizations overlapped so tremendously. For the first time, that group felt like a team. They were cohesive around a consensus of

what the corporation ought to be and it changed the direction and life of that organization. It extracted a commitment out of planning that was unbelievable. That organization had no planning. Within three months they had a planning staff with an outstanding man brought in to head it and it started a planning activity that has persisted ever since. Out of the excitement that emerged out of a recognition of agreement, the commitment was extracted.

The fourth thing that happens in this process, is that it unleashes an unbelievable amount of creativity. This is a topic that I wish we really had time to explore. There are very selfish and personal reasons I would like to do so. I have a book that will be out in June that deals with this subject, called: "The art of problem solving". Creativity has been a fascinating subject for me for many years. It evolved out of an experience I had with my oldest daughter when she was a child.

One day I came home from work and after dinner I immediately went into my study to catch up on some work. I was working under some pressure. My daughter came in from the next room, a little family room we had, and she stood there by the desk. She was about 13 at the time. She is now a grown woman. After a bit I acknowledged her presence and said: "What is the matter, Karen? What do you want?"

She said: "Daddy, we have an extra credit problem in mathematics today. I can't do it. I wondered if you could help me? If you show me the answer I won't turn it in as my own, but I would like to know what the solution is." I was very impatient and annoyed and I said: "All Right, Karen, get the problem and show it to me. Let's get this over with." She disappeared and came in with a single sheet of paper that was copied. On the paper there was a diagram at the top, which looked like this: It had nine dots arranged to form a square. I am sure you all know this one[4]. It had instructions underneath, which said: Take a pen or a pencil, put it on one of those dots and then draw four straight lines without lifting your pen or pencil from the paper so that it will cover the nine dots. That is all it said.



She said: "Do you know the answer?" I said: "Oh, hell, I did this one when I was a kid." She said: "Fine, just show me the solution." - I could not remember! I started, and everything went wrong. You know, I went 1-2-3-4 - and I had an uncovered dot. She said: "No it can't be that, it must be two diagonals." So then I started by taking a diagonal up, a second diagonal, and up, and now I had two uncovered dots. I wasn't getting any better. I did this for three or four minutes and I was just getting nowhere. Finally I said: "For Gods sake, Karen, I am busy, and this is an extra credit problem. Forget about it." She looked at me and mumbled, but I heard what she said: "And you are supposed to be a professor." She walked out of the room in a huff. She left the door open between the study and the family room. A short while later I could hear her crying, sobbing in the next room. I could not stand it. I got up and went to her. "Well, all right, Karen, what is the matter now." "I am ashamed to go to school without an answer to that question." "Oh, you must be kidding." "No, I really do want to know." "All Right, if it is that important to you, come back here and we will look at it seriously." She looked at me skeptically and she took the sheet of paper and came back into the study and we sat down and I started to talk to myself out loud:

"Karen, do you know the difference between a puzzle and a problem?" She said: "A puzzle is just a hard problem." I said: "No, it is true it is a hard problem, but it is more than that. There are plenty of hard problems that are not puzzles." She said: "No I don't know what the difference is." "Well, a puzzle is a problem that you can't solve because of an assumption that you incorrectly make. Therefore the trick in solving any puzzle is to identify the inappropriately applied assumption. You remove it, and then the solution becomes easy. That is why it is always a surprise when we see the solution to the puzzle. It always looks like a trick. The problem here is that I have not been able to identify the assumption I have made which keeps me from solving it. So let us look at the assumptions I have been making." She said: "I don't understand any of that. Just show me the solution." I ignored her and kept talking out loud. "The first thing is perfectly obvious. I assume that this piece of paper must lie on a desk, and I must draw on a flat surface. But there is nothing in the instructions that tell me that. Suppose I fold the paper." Immediately, I saw a solution to the problem. "If I take the sheet of paper and I fold it across the bottom line of dots, then fold it across the middle line of dots, and then by pushing this line in and pulling this line out, I get the paper folded so it looks like this. You see this, this is the bottom set of dots. And I fold it up so that the bottom set of dots fall directly on top of the top set of dots." Then I took a felt tip pen and drew a line, holding it against the edge of the fold. Now, when I unfolded the paper, this is what I had. See, I had drawn a line across here, but this line here was folded up and I had drawn it against the edge, so I had two lines on the paper when the paper was unfolded, like that. But I still had the pen down on the paper. That is one line. Two, three, four.

She was delighted! She grabbed the paper and started.... I said: "Now wait a minute, we can do it with one line." She said: "No, no, I will settle for four." I said: "No, you've got me started on this now." So she had to sit there impatiently. We took the paper and folded it across here, then folded it halfway between. It folded the top line and the bottom line down across the middle line with just a little tiny space between them, right over the middle line of dots. Then I took a felt tip pen and drew it along, and one line covered all nine dots. She said: "That is fine, but I don't want that." She marched off. Her faith was slightly restored, but not much, and I had no further discussion of it with her that night.

I could hardly wait, however, the next day to get home.

When I got home, she was sitting in the family room as I walked in the door and I said: "Hello." She grunted at me. I waited a minute and said: What happened? She said: "Where?" - "In school." - "What do you mean in school?" - "Oh, come on, Karen, you know perfectly well what I want to know. What happened?" - "Oh, you mean in class." - "Yes, I mean in class." - "Nothing." - "Something happened. What?" - "I don't want to talk about it." - "Why not? Come on, why not?" - "Because you are going to get mad." - "That's right, I probably will. But you better tell me anyhow. I am not going to get mad at you." She sighed, hopelessly, and said: "All right, the teacher asked us if anybody had the solution to the problem. Five kids raised their hands. So she called on one of the other girls to come up to the blackboard and show the class the solution. A girl went up, and she did the following." Karen drew this: (picture) and that was the solution I had known as a kid, but I had forgotten.

The trick of course or the assumption in this case, was that you do not have to stay within the perimeter of the square. There is nothing in the rules that tell you you have to, but you automatically assume it and hence the puzzle.

So I said: "Great, that is the solution I used to know, but I did not think about. What happened when you showed yours?" - "The teacher after this was done, thanked the girl, congratulated her, told her to sit down and started talking about a different subject." - "What happened?" - "I raised my hand. The teacher stopped and said: 'What's the matter, Karen?' I said I had a different solution to the problem. The

teacher said: 'You can't, Karen, there isn't any different solution to the problem.' (laughter) I said: There is! The teacher said: 'Karen, I just told you there wasn't.'" My daughter has a very slow boiling point, but she is my daughter. She said: "There is, and my father gave it to me, and he is a professor." The teacher said: "I don't care what he is. There is no other solution." Karen said: "There is! And not only is there another solution. I can do it with one line!" (laughter)

At this point the class was murmuring, and the teacher recognized that she was in an indefensible position, so with great annoyance, she said to my daughter: "All right, come to the board and show the class." My daughter said: "I can't do it on the board, I need a pad of paper." - "Why?" - "If you give me a pad I will show you." So with great annoyance the teacher got an easel with a pad. My daughter went up to the pad and put the nine dots down. Then she took the paper and began to fold it. The teacher said: "Wait a minute, Karen, what are you doing?" - "I am folding the paper." - "You can't do that." - "Why not, the instructions did not say I could not." - "I don't care what the instructions said, that is what I meant. Sit down!" (laughter).

That is what kills creativity. My daughter learned an incredible lesson that day: That the purpose of the problem given to the students in class has nothing to finding a solution. It has to do with finding a solution that the teacher knows. We kill creativity in that way systematically in the educational process both at home and in school. What creativity is, is the ability to recognize self-imposed constraints and remove them. What this process does, is force you into a mode of relaxed constraints, so that you can think creatively without the obstructions of unconsciously assumed constraints.

Let me give you one of the more surprising examples I have personally experienced. We were working with the Federal Reserve Board, working with the senior officers, in the redesign of the banking system. We had just finished reviewing the work on the check clearing problem, and so there was a great deal of discussion of this. Somebody said: "We are going to have to get rid of checks in this ideal system." Everybody agreed. Somebody said: "Why don't we go to an electronic funds transfer system."

I don't know how many of you are familiar with the system, but you probably know the basic idea. The basic idea is: If you are running a store, and I come in to buy something from you, instead of writing out a check that I give you in payment which you then send to the bank. (If you saw that process, you would not believe the clearing process). Instead of all that, there is a little electronic device on the sales desk. What we do is I take an identification card and I put in that machine. You take your identification card. You put it in. We indicate by which side we put it on, who is paying whom. It is easy, just by position. Then you punch in the amount. That is all you do. There is an automatic, instantaneous withdrawal from my bank account and an insertion into yours. And no paper is involved. That is the basic characteristic of electronic funds transfer. It is now widely used in a number of places.

So we said, OK, we are going to a national electronic funds transfer system. Everybody agreed. Somebody said: "You know, if we could require that all income had to be paid through this system, then the banks would have a complete record of everyone's income." Some people began to smile maliciously at that. Somebody else said: "Yeah, look if that happens, if we also force people to have one bank account, then it will be possible for the bank to prepare their income tax." Somebody said: "But you can't. How are you going to force people to have one bank account." Somebody else said: "We don't have to. There is an easier way. Why don't we make every bank account number contain two numbers. The number of the bank and the social security number of the depositor. Or the corporate identification number. Then it does not matter, because in a central computer system, you can compile all the accounts of any individual by social security number."

Somebody else said: "If we did it that way, it would be possible to completely automate income tax and relieve people of any necessity of making out the income tax forms." Then one of the quiet people in the room said: "Now, wait a minute. You can't make out income tax unless you know expenditures. It is not enough to know income." Somebody else said: "Yes, but you know, if all your income went into the bank, then everything you spent would have to be a withdrawal from the bank. Therefore we could have a record of all the withdrawals. No problem." And then somebody came up with an idea:

"Look, if we have a complete record of both the all the income and all of the expenditures, why are we taxing income? Why don't we tax consumption?" Now the place went crazy! Look what happened! Somebody said: "Hey, that means if, say I earn $50,000 a year. I put it into the bank, and I only spend $25,000. Then the $25,000 I don't spend do not get taxed. That is a hell of a lot better than getting savings interest. Because my tax rate is a lot higher than anything that I get in interest on the savings, right? So there is a tremendous incentive to save. Namely you don't pay taxes. But that means the banks get all the money for nothing." "Fine," somebody said. "Then it has to lend it for nothing. Loans would be made without interest. The only thing that would be required would be a service charge. What we would charge for would be the use of resources, not the creation of it. Corporations as well." Within the next half hour, they began to design an economic system, based on a consumption tax, which struck them as being a lot more rational than an income tax, because it placed the incentives where they make sense, towards a reduction of unnecessary consumption, not towards reduction of income. When they were finished, they were just delighted with the design. They felt of course, that it was completely impossible from a political point of view.

By the way, I might mention to you that both Sweden and England currently have bills before their national legislatures for consumption based tax systems. However, what they did go on to do, was to consider how to change the current system so that the ultimate transformation from an income to a consumption based tax system would be possible.

The point I am making is this: A group of staid, conservative bankers came up with a complete redesign of the tax system of the United States. They never would have done it under normal circumstances. But by engaging in this exercise, where all constraints were removed, they attained a level of creativity they never otherwise would have achieved.

The principal obstruction to creativity is one that you all run into every day of the week as planners, and it is the bane of your existence. You come up with a marvelous idea, and it is great, but it is not feasible. It is not practically possible.

I have to tell you a story in this connection. When I was down in Mexico, one day I got a call from the chief transportation planner of Mexico City, a man I knew. He asked if he could come up to see me with some of his colleagues. They had a problem that they wanted to consult me on. They appeared in my office later that afternoon, about four of them, and they showed me six alternative transportation plans for the City of Mexico. They had maps and charts and the whole works.

He said: "Our problem is this: How do we evaluate these alternatives. How do we decide which one is the best?" I said: "You don't have to." "Why not?" "None of them are good enough." And the head of the planning commission looked at me as though he would love to kill me. I could understand that. "What do you mean, they are not good enough?" "I am sorry to offend you, but these are all plans based on alternatives that have been tried extensively and none of them will solve the congestion problems of Mexico City. Your problems are considerably greater than anything these things can solve."

I don't know how many of you know Mexico City very well. Even if you are in New York, you don't have any idea what congestion is. The last major crisis in Mexico was a traffic jam that lasted twelve hours involving 24,000 automobiles in which some 30 people died because they could not get medical aid to them during this time. The congestion is just unbelievable.

So he turned to me and said: (essentially, he did not use these words) "All right, wise guy, do you think anything can be done that would make a difference." I said: "Yes, I think a lot could be done that would make a difference, but you have not considered it." "Like what?" Well, in the next hour we discussed eight alternatives. I will only mention a couple of them. The first one I suggested is the decentralization and diffusion of the Mexican government. All of which is in Mexico City. I pointed out that if the federal government were dispersed around the country, 40% of the people in Mexico City would be removed from it. This would considerably reduce traffic. Furthermore, it was very desirable for other reasons. He listened to all this nodding, and said: "Of course, of course, of course. Everybody knows that, but it can't be done." "Why can't it?" "It is politically infeasible." "How do you know?" "I am a Mexican. I know. How do you think you know? You are an American. Take my word for it, it can't be done." "All right, you are the boss."

"Do you have another suggestion?" I said: "Yes, change the workday." "What do you mean?" "Well, in Mexico, the normal workday is ten to two, and five to eight. That means that there are four work trips a day for the average Mexican. If you go to the American workday, nine to five, you will have two work trips a day and you will reduce the traffic in Mexico by about a third. Besides, you will improve the quality of family life. Why don't you change the workday?" He said: "Are you crazy?" "What is the matter?" "The siesta is a Mexican institution." "Oh, come on, you guys don't sleep from two to five. I know what you do." "It doesn't make any difference what we do. It is the idea. You cannot stop the afternoon siesta." "Why not?" "It is politically infeasible."

"Do you have any more ideas?" "Yes, change the automobile." "What do you mean, change the automobile?" "I was curious when I got down here. I wanted to see if something I know is true in Philadelphia was true in Mexico City. So I did a study. I took a number of students. We went out in the streets and we counted the number of people in automobiles. What do you think is the average number of people is in a Mexican automobile?" "I don't know." "I'll tell you. It is 1.2." -(Writes 1.2 on blackboard) This is the passenger (1) and that is the driver (.2). (Laughter). "87% of the cars in Mexico City only have one or two people in it. Why don't you require that all automobiles be two passenger cars. Then design one small enough to do that." "Suppose you have a couple of kids. Do you want..." "That is easy. We will design it so they hook on to each other." "What good will all that do?" "Well, we happen to have studied this problem. You will get a 540% increase in the carrying capacity of the streets. That will carry you well beyond the year 2000." "Well, that is very interesting, but we really can't do that." "Why not?" "You will never get the automobile companies to agree to this." "So we will get the government to make them." "That is politically infeasible."

I went through the eight, and for everyone he told me it was politically infeasible. So I finally stopped and I said: "There is an expression in English. I don't know whether you have it in Spanish or not, but you know the expression that politics is the art of the possible?" "Yes, we have exactly the same expression." "Good. It is politics that is the art of the possible. Not planning. You are practising politics and calling it planning. Planning is the art of the impossible. Planning has to do with how do you make what appears to be impossible possible. Not how do you decide that everything that is worth doing is impossible. You have to drop this preoccupation with political feasibility." "How can I? I live in a political environment."

Then we got to the subject of idealization. Because idealization is the principal impact on the organization. The main one is its impact on their concept of what is feasible. I would like to show you how and why that happens. The normal model that we have in our minds of planning is that planning is like a chain. A plan consists of a set of programs or projects that are links, each one of which is a link in a chain. Everybody knows that a chain is no stronger than its weakest link. Everybody knows that in planning, the whole plan is not more feasible than its least feasible part. So if I have a broken link in a chain, I don't have a chain. If I have a plan which has a program that is infeasible, then the whole damn plan is infeasible. Right? Wrong! Because the chain model is irrelevant.

A plan is not a chain. It is a system. And every system has properties that none of its parts do. Consequently, it is possible to have a plan that is feasible, not a single part of which is feasible when considered alone. And it is possible to have a plan, every part of which is feasible when considered alone, and the whole is not. Both are possible. It is the recognition of that that has an incredible impact. Why?

Now let me come back to the Paris story and show you. I want to tell you about three of the recommendations that came in the Paris plan, that were made to the cabinet of France. You judge as to how feasible these are.

The first recommendation to the cabinet of France was that the capital of France be moved from Paris. Does that sound like a very feasible recommendation to you? Paris is the oldest national capital in the world. And yet for some peculiar reason the cabinet of France by resolution accepted the recommendation, picked 1983 as a target date and picked the new location for the capital of France. That has all been done. How come?

Recommendation number two: That Paris be declared an open city, self governing. Not subject to the government of France. Paris has 40% of the French population. It has the largest concentration of national population of any city in the world. Why in the world would France agree to let Paris go. But they did. By resolution of the cabinet they accepted the principle and have picked a date in the 1990's by which Paris will become an open city, and last year took the first critical step. They gave Paris a local government, which it never had before. It was always governed by the cabinet directly. It now has a city government.

For those of you who have spent any time in France, the third one is the most inconceivable. The recommendation was that every public school in France require every child going through them to have two modern languages. Only one of which is French. Can you imagine France requiring everybody to know a second language? France has the most incredible legislation with regard to language of any country in the world. Do you know that a french professor at an international conference held in France, if he speaks publicly in a language other than French, has committed a crime for which he is subject to imprisonment. No matter how articulate he may be in that another language, he **must** speak in French. A Frenchman getting up before an audience like this in France and talking in English because you don't understand French could be imprisoned. That same country has agreed to requiring everybody to have two languages. Why?

Well, let us go back to the idealization of Paris.

By the way, this has all been published. In the last issue of the transactions of the Royal Society of London, you will find an account of the Paris plan by Hasan Osbekhan, who was the member of our staff in charge of that project. It is all there.

Over 4,000 Frenchmen participated in the preparation of an idealized redesign of Paris. And there was absolute, unexcepted agreement on what Paris ought to be. This is why 11 political parties supported it. What do you think they all agreed Paris ought to be? It is obvious! What ought Paris to be ideally? --- You are getting warm, come on. --- You are being too modest. ---World Capital. ---Precisely! Paris ought to be

the capital of the world, and every Frenchman wants it to be that. No disagreement. Now, they don't mean the capital of the world government, because they don't believe there is going to be a world government. But they mean capital of the World in the sense it the sense it will be THE city in which most of the world activity will be centered. Worldwide activity. The whole plan of Paris is focused on gradually converting it to that position, of being the capital of the world.

Now look. Once that is accepted, can that city house the capital of a nation? Of course not! That is completely in conflict. The cabinet recognized this immediately and said, of course we have to move the capital of France. Can it be governed by a nation? Of course not! People have to be able to come and go without any difficulty from immigration or customs. It must be an open city if it is going to serve effectively as capital of the world. Of course it has to be multi-lingual. Look at what happened. In the place of a shared ideal, a set of alternatives, each of which is infeasible when considered separately, became completely feasible as a set.

That plan is in execution. It may never completely executed, as politics is an unpredictable area, but it has in fact been accepted and is being acted on today. So the idealization converts our concept of what is possible.

Question: "What about the problem of gaining support if the ideal design seems unattainable?"

Answer: It does not make a damn bit of difference whether it can be attained or not. The only thing you are asked is what system would you build if you could build any system you wanted to. Feasibility is irrelevant. Absolutely irrelevant. The point is this: - I'll tell you one more story.

When we completed the design of the national scientific communication and technology transfer system, that was a very large design and a very complicated system in which some 3,000 people were involved across the United States. It was tremendously complex moving towards consensus. There is absolutely no consideration of feasibility in the design. None whatsoever. You look at any component of it and you say it is inconceivable. There is just no way you can get that to happen.

When it was completed, the National Science Foundation, which was the principal sponsor of the effort, asked us to present it publicly, and we agreed to do so. The audience they had picked to do this with, that is the unveiling of the design, was a special libraries association, which is the association of all librarians of non-public libraries. Your company librarian is a member of this association. It is a huge association. Their meeting was in Denver and they had about 6,000 people there.

We were given the full plenary session to present this design and have discussions. It was a three hour session, and we spent the first hour and a half presenting. The second hour and a half, there was excited and very interesting and provocative discussions. A lot of fun. About the fifth or sixth person into the discussion there was a young man who got up on the floor and this is almost exactly what he said: "Dr. Ackoff, that design is the most exciting and important thing that has happened in this field since it was born. It really is marvelous, and the people who worked on it should be congratulated. This is the first thing that has ever excited me in the field. BUT," he said. - Oh, oh, what is coming now. - "Why in the world do you call it an ideal? There isn't anything in that plan we could not have tomorrow if we really wanted it."

I could have hugged and kissed that young man, because he got the point. The point is that the principal obstruction between man and where he would like to be is what? Man! That is what this is all about. What it is about is designing a desirable future and removing yourself as an obstruction to attain it. That is what this planning is all about. It is a recognition that the principal obstruction between where you are and where you would like to be is yourself, your organization, or whatever it is, and

removing that as an obstruction. The excuse that we cannot do it because "they" won't let us, is nothing more than an excuse for inactivity. There is no such thing as: "They won't let us."

Recently, at the university, they told me when I proposed that we get rid of some of the incompetent professors. They said: "You cannot because they have got tenure. They've got tenure. You can't get rid of them." In two days work with a couple of students we found 13 legal ways of violating tenure. Of course you can get rid of people with tenure if you want to. If you don't want to, then you simply say: We can't because the law won't let us. But that is self deception. That is not the law. That is the acceptance of the self-imposed obstruction.

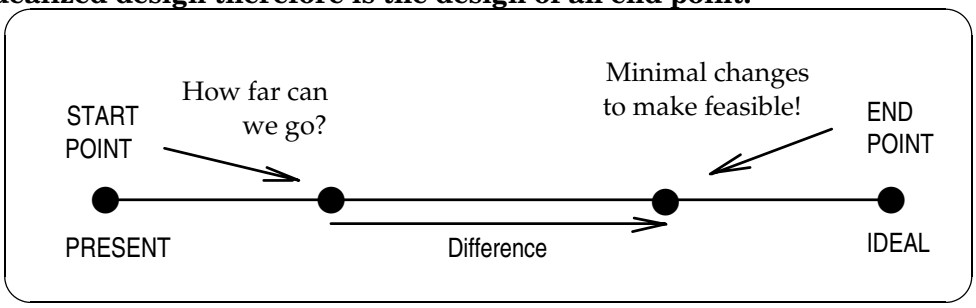
What this planning is about is the removal of those obstructions. And even if you don't get anywhere, you at least realize that you are not because of what you are doing and not because of what somebody else is doing to you.

Question: "Would it be correct to say that the essence of what you are saying is that you first have to define where you want to go and not worry about how you are going to get there."

Answer: That is right. That is why it is called ends planning. There is no discussion of how you are going to get there at this stage. There will be when we come to the next stage. **The idealization process normally starts by identifying the characteristics you want the system to have**. You don't talk about objectives or goals. It is too vague or abstract. It is like the telephone. What properties you want the ideal telephone to have. No wrong numbers for example.

What properties do you want your corporation to have? You start by identifying those properties. It is only a tentative list. Now you begin to design the system to show how those properties could be incorporated into the system. That is a systemic design. It doesn't tell you how to get there at all.

The idealized design therefore is the design of an end point.



When we move to the next stage of planning, which was means planning, we ask the following questions: Here (end point) is the ideal. Here (start point) is where we are now. Instead of standing here (start point) and asking: How far out can we go? We do exactly the reverse. We stand here (end point) and ask the following question: What are the minimal changes we must make in that design to make it feasible? What is the least we have to do to make it an attainable objective? That is an incredible experience to go through.

We did this recently in a university, that had been absolutely paralyzed by its inability to do anything for twenty years. They simply had not been able to execute a single major modification in the university over twenty years. So we sat them down and developed an idealized design of a university. It took several months to do it, but it was done.

When it was done, a meeting was held in which the principal representatives of all the factions in the university came together. The provost of the university started with a simple question: "What are the minimal number of changes we have to make

in this design to make it feasible?" About an hour later they made three minor changes and that was it. That became the target.

The result is that by starting here (end point) and walking this way, they wound up with a design out here. When you start here (start point) and go out that way, you only get a design here. That is the difference between the two approaches in planning. It is that distance. It derives out of the different concepts of what is feasible, and the recognition that the real obstructions are internal, not external. Planning is converting a puzzle into a solvable problem.

Means Planning

So in the means part of planning, you now start by saying: What is to be done to bring about the best approximation that we possibly can? Here you invent. Why invent, rather than select? Because in most actual cases, none of the available alternatives are good enough. But when you release yourself to invent new alternatives, like the ones I was talking about in transportation, they are generally superior.

By the way, Lopez Portillo, the current president of Mexico, initiated the dispersion of the Mexican government and it is well under way. He changed the working hours of Mexico City. Not in one fell swoop. He cut the midday break to two hours and that has already had a considerable impact on traffic. They are doing experimental work on the redesign of the automobile right now. All those things that were impossible a few years ago are being done right now. The only obstruction is in the mind.

Resource Planning

When you get down to the next step, resource planning, you now have your ideals, your objectives and your goals set down. You have got the means by which you are going to pursue them. In resource planning you ask three questions about each of five types of resources. **The three questions are**:

> **First** - How much of each type of resource are we going to need to do the things I have decided to do?
>
> **Secondly** - How I am going to generate or acquire those resources?
>
> **Thirdly** - How will I use them once I have them?

The three questions: What will I need? How am I going to get it? and How will I use it when I have it? That is asked about each of **five types of resources**.

> **First**, people, what we used to call manpower, but we don't any more, since we have been liberated. - People!
>
> **Second**, plant and equipment. Fixed facilities, capital investment.
>
> **Third**, materials and energy. The inputs.
>
> **Fourth**, money.
>
> **Fifth**, information.

Therefore what you have is **three questions**, asked about each of **five types of resources**. So resource planning involves five times three or fifteen different types of inquiries.

So for people, what kind of people are you going to need to accomplish your objectives with the means you have selected, how are you going to get them. You either acquire them by going outside or generate them by training internally. And then how do you use them once you have them? Let me, if I can apologize in advance for a piece of what is called engineering arithmetic, show you a very interesting calculation. The question of how are we going to use a resource is one out of three questions, so it is

one 1/3 of resource planning. The question of how are we going to use money, which is 1/5 of of the resources to be considered, is 1/5 of resource planning. Resource planning is only one of five steps here. Therefore the question of how to use money or budgeting is a maximum of 1/75th of planning. Budgeting is not equivalent to planning. It is at most 1/75th of the process. There is a lot more to planning than budgeting. But budgeting is a part of planning.

Organizational and Management Planning

The next step of planning is concerned --- arises for the following reason. I have never seen a good plan that could be carried out by the organization that prepared it. You always require organizational redesign, and modification of the management system to make it possible to execute the plan.

So the next part of planning is concerned with the redesign of the organization and its management systems, so it is capable of executing the plan.

Implementation and control

Finally, the concern with the scheduling of the implementation. Who is to do what, when and where? The implementation and the control. The continuous evaluation of the implementation in two senses: Is it being done? And if it is being done, is it producing the anticipated results? If not, is the plan being adjusted to take into account what is wrong?

I've been going very quickly through the latter parts of planning, because they are fairly well developed in the literature. But each of these can be discussed in as much detail as we have discussed any one of them.

In planning, all of these things go on simultaneously. One of the things that people frequently ask me is: Where should you start the planning process. Suppose I am not at the top of the organization. I am two or three levels down. Where should I start? The answer is: Wherever you are. You can start planning anywhere, and then you bring pressure to bear on the rest of the system.

We were asked to do a series of courses of two days length for all the executives in the management sciences and planning. This involved about 250 people. They did it in groups of 20, so there were a large number of sessions spread out over time. In typical fashion, they started with the lowest level of vice presidents and worked their way up.

The first session in the two days, the guys in the group said: This stuff is marvelous. Boy, we really ought to be doing this stuff. And we want to. But we can't do it unless our bosses approve. Are you going to get a chance to talk to them? Are you going to be telling them all this? - Yes, we are going to have a whole series of sessions and everything. - Great! Once they are with it, we can really go ahead. - Fine. Now, every group in the first batch asked the same question. So we kind of got curious. What is the next group going to ask when we get there. Well it was clear, because we got there.

At this intermediate level of vice presidents, what do you think was the first question they asked us: Are we going to talk to the senior vice presidents? Because they could not do anything unless the senior vice presidents approved. Now we started to get really curious. What happens when we get the last group, which is the board? The last meeting was held in the board room. It was a day and a half or so.

At this point the chairman of the board said: "This is one of the most exciting things I have ever done. It is marvelous, we really must do this. Are you going to get a chance to talk to the executive vice presidents, because if I don't have their support, I really can't do this."

That is called passing the buck. No matter what language you put it in. Everybody is using as an excuse for not doing something, either his superior or his subordinate.

The place to start doing something is where you are. And if you cannot do it there, then you have got to decide are you an employee or a professional.

End of Seminar

1 In the first section, Dr. Ackoff gave an account of our society's transition from Machine Age Thinking to Systems Thinking.

In the second section, Dr. Ackoff continued with Management Styles, as they relate to Varieties of Planning. He introduced the operating characteristics and principles of Interactive Planning.

In this third and final segment, Dr. Ackoff goes into more details with continuing heavy emphasis on the interactive planning process.

2 The student of PCT recognizes that this segment deals with the planning for, establishment and communication of reference signals on a corporate scale.

3 With the PCT perspective, you realize that the whole company is made up of individual control systems (people), each of whom needs good information to control well.

4 Refer also to page 89-90 in Dr. Ackoff's book: *Redesigning the Future: A Systems Approach to Societal Problems.*

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