ackoff

ACKOFF: I started college in architecture and engaged in that field for five years, and received a degree in it, at the end of those five years, I was permitted to take some electives for the first time, and I chose the electives in the philosophy of science. And that became a major interest to me.
When I graduated in architecture, I had a fellowship to continue graduate work in the field. But the philosophy department surprised me by offering me an instructorship in the department. Then World War II intervened very early in my graduate work. And when I returned, I was in a hurry to get finished with my degree. So I spent full-time in philosophy of science and I was hooked.
My first full time teaching job was at Wayne University in Detroit, where I spent four years, and then moved to Case Institute of Technology where I spent 13. And then at the University of Pennsylvania Wharton School where I spent almost 25 until I retired from there in 1986. I still teach there, but primarily in the continuing education programs.
SPEAKER 2: The Second World War had a big effect on Ackoff's early career.
ACKOFF: I did not coin the term operational research. As a matter of fact, it was coined here in Britain during the war. But I was a partner with West churchmen in establishing the first academic program and operations research at Case Institute of Technology, where we gave a degree in the topic, and conducted research for private and public organizations.
We were trying to develop the field so that it was teachable as a graduate degree program. And it led, within a few years to our producing the first textbook in the subject called An introduction to Operations Research. And that started a flow of publications that enlarged knowing the field through the late '40s, the '50s, into the early '60s, and then some fundamental changes began to occur.
The field of operations research or operational research, as it was called in England, was developed in connection with efforts to manage World War II more efficiently. In fact, it was a book written in which success of the allies was attributed to three technological developments. One was radar, one was sonar, and the other was operational research. So at the end of the war for the first time it began to be employed outside the military. And that's where we played a major role.
SPEAKER 2: Operational research attempts to provide an objective and quantitative basis for the solution of managerial and administrative problems. It was one of the key tools used by allied forces in the war.
ACKOFF: We came to the conclusion that operations research was limited for several reasons. We found first that the problems that we were solving tended to generate additional problems they were better problems, and usually more problems were created by our solutions than the problems that we solved. We also found that the solution to one problem depended very critically on how other problems were being treated at the same time. And so we got to focus more on the way problems interacted and their solutions interacted than we did on the problems taken separately.
The natural model of inquiry is to cut things down the size. But we were discovering gradually that you have to increase their size to make them tractable when you're dealing with systems that contain people. And we began to identify this change and suggest a diversion in operations research, the creation of another path for development.
But operational research professionally rejected that proposal. And so in the late '60s, we left our operations research professionally to start social system sciences. The difference between the systems

approach and operations research is very fundamental, and is multi-dimensional. So it's difficult to explain simply, but let me try.

Operations research, like typical scientific research, proceeds analytically. Now analysis is a simple process. The process you can observe in any child when the child is given something that they've never seen before, and they want to understand it.

The first thing you do is take it apart, and you try to understand the parts taken separately. And then you try to assemble the understanding of the parts into an understanding of the whole. So for example, if you try to understand the business, you have to first break it apart into production, marketing, finance, personnel. Understand each of them and assemble them into an understanding of the whole.

All scientific research, essentially analytic, and it was a crusade in search of the ultimate part, the element, because it was believed that when you understood the ultimate parts of things, you could then reach ultimate understanding of the whole of which they were part.

What we discovered in the 1940s and '50s is that analysis cannot produce understanding of systems. A system is a whole whose characteristics derive out of the interactions of its parts, not the actions of its parts taken separately. It's the way the parts interact.

And therefore when a system is taken apart, like an automobile, if it's disassembled, it's no longer an automobile. It's not the sum of its parts, it's a product of the interaction of its parts. So the automobile loses its characteristics when it's disassembled, and so do its parts. And automobile can't move without a motor. But if you take the motor out of the automobile, it can't move anything.

Now we discovered that when you try to explain a system using analysis, the first step is you take it apart. And of course, it loses all of its characteristics. You cannot understand the system by looking at its parts. You must look at it as a part of a larger whole.

So analysis we discovered yields information about the structure of something and how it works. That's knowledge, know how. Explanations lie outside. That's synthetic thinking. Synthesis yields understanding, analysis yields knowledge. And it was that distinction that was critical for the emergence of the system sciences. It uses both.

But to understand systems, particularly those that involve people, synthetic thinking is required. The way this point of view developed is not the result of what the psychologist calls an aha experience, where you suddenly have an insight and there's the thing and you see the big difference.

It evolves, and in my case, it evolved out of practice. I was continuously confronting problems in social systems that I found that the traditional methods of operations research couldn't deal with. For example, operations research is largely the application of mathematics to the solution of managerial problems. Most of the problems in large systems, strategic problems, organizational problems do not involve quantities, they involve qualities. So increasingly I had to worry about how to handle qualitative factors and systems as opposed to quantitative. And that raises questions about the effectiveness of the mathematical analytical technique.

The model and operations research had originally been the use of methods of physics in the study of managerial problems. That became increasingly dysfunctional. And we had to develop something to replace it. And that occurred over time. It was an evolution, not a solution.

The reception of systems thinking was very mixed. Many who are opposed to any type of change gave the typical response, which is it all old hat. There's nothing new. And they continue to do what they had been doing without paying any attention to it.

As long as we're dealing with simple things, the old system was fine. But if we're trying to understand the phenomena of a transformation of a social system such as the Soviet Union went through, mathematical equations won't give you the answers.

There's another very fundamental change that systems thinking had to take into account. In 1900, it is estimated that about 95% of the people employed in my country could not do their jobs as well as their bosses could.

Now it's clear why. If you have a group of people operating drill presses and the foreman retires, then somebody would look over the people operating the drill presses and pick the best one to be the foreman. So he can now do drill pressing better than any of his subordinates. And people would rise as long as they were the best in the group in which they fell. That gave rise to the famous Peters principle that all managers rise to the level of incompetence.

Now today it's estimated over 95% of the people employed can do their jobs better than their bosses can. you cannot manage them the same way. When you're managing subordinates who know how to do what they're doing better than you do, you don't manage what they do, you manage the way they interact. That requires a different type of organization and a different type of management. Conventional management and conventional organization will not do it.

What I've just described seems to make common sense and be obvious. And so the most obvious question that I'm constantly confronted with is why aren't more organizations doing it? And that's a very fundamental question that's very important to know the answer to that, because you can't overcome the problem unless you understand it. So let me try to explain why this happens.

You never learn by doing something right because you already know how to do it. You only learn from making mistakes and correcting them. Now there are two kinds of mistakes. You can do something you shouldn't have done. That's an error of commission. A corporation can buy another company it should not have bought.

The second type of error is you didn't do something you should have done. That's an error of omission. You didn't buy a company you should have bought. Now of these two types of errors, one is very much more important than the other.

Errors of omission, if you look at companies that fail or have trouble, if you take IBM in the 1980s. It was what it didn't do. It did not go to the smaller computer that got it in trouble. Not what it did. Now, if you look at accounting systems in your country of mine, only one of these two types of error are recorded.

When you do something you shouldn't have done, that will eventually appear in the books. But when you don't do something you should have done, it never appears in the books. Now you're in an organization that says making a mistake is a bad thing, but there's only one type of mistake you can be caught on. That's doing something you shouldn't have done.

Therefore, if you want to maximize personal security, what's the best strategy? Don't do anything. Minimize the changes that you bring about that will maximize personal security. So if we want to change, and that's part of what we're trying to do through organizational design, we have to start to record mistakes and systematically learn from them. That's part of systemic thinking. But it also explains why most organizations are reluctant to change because they're security seekers.

SPEAKER 2: Ackoff's attempt to elevate the subject helped to put OR on the intellectual map. But after working in the field for over 20 years, Ackoff felt that he had taken it as far as he could. For him, systems thinking was the only way of overcoming humankind's natural resistance to change.

ACKOFF: I think the principal problems that confront us is how to make these ideas more acceptable to a larger number of people who are in a position to do something about them. It's a very difficult task because we are a very conservative culture, we're very satisfied, generally speaking, with where we are. And our principal attitude is let well enough alone don't rock the boat, let nature take its course. Rather than recognizing that we're an airplane flying through a hurricane, and if we don't continuously adjust our position and direction, we won't get there.