Where do You Intend to Go Now?

By Russell L. Ackoff*)

Summary

Distinctions are made between input-, output-, and market oriented professions. Each tends to see its future direction in a different way. Moreover, a profession can evolve or devolve by changing from one type to another. Operations Research is used to illustrate the devolution of a profession from one that was market-oriented through an output- to an input-orientation. The answer to the question "Where do you intend to go?" given by a market-oriented professional must be "Where my users take me."

The question, "Where do you intend to go now?" to which I was invited to respond, is not as simple as might appear. On reflection I found that it requires an understanding of the nature of professions in systems terms, and a determination of the type of professional I take myself to be.

Professions are conceptualized in the same ways that business enterprises are organized; that is, labor is divided. In dividing labor, three different criteria are used: *inputs, outputs,* and *markets.*

Inputs are functions required by an enterprise as an organization. For example, a corporation may have purchasing, maintenance, manufacturing, distribution, marketing, personnel, and finance departments. A university has separate departments for various disciplines.

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Outputs are the product or services produced. For example, General Motors has Cadillac, Buick, Oldsmobile, Pontiac, and Chevrolet divisions. Academic programs are output units in universities, their output being graduates with specified degrees.

Markets are classes of consumers or customers who are defined either geographically – for example, North American, Latin American, European, African, and Asian divisions of multinational corporations – or by type – for example, manufacturers, wholesalers, or retailers. In universities, alumni, admissions, and student-affairs offices are defined by their markets.

All this is widely known. What is not so well known is that professions too are oriented in ways that correspond to the ways enteprises are organized. There are input-, output-, and market-oriented professions, and these are very different from each other.

Input-oriented professions are ones that define themselves by the tools, techniques, and methods (the instruments) they use in solving problems, for example, applied mathematicians, statisticians, computer programmers, accountants, and operations researchers. Such professionals are supposed to work only on problems to which their instruments can be applied. This requires those who employ them to know the types of problem to which such professionals can apply their skills.

Input-oriented professionals search for problems to which their skills are applicable. In addition, of course, they try to extend their skills and the types of problem to which these are applicable. Therefore, their answers to the question, »Where do you intend to go now?« are likely to identify (1) extensions of current tools, techniques, and methods; (2) development of new ones; and/or (3) new types of problem to which they hope to apply their skills.

Enlargement of the class of problems to which input-oriented professionals try to apply their skills can be dangerous. The danger is that ambition often leads them to try to apply their skills to inappropriate problems. This is reflected in an old story about an ardent do-it-yourselfer.

A neighbor of this do-it-yourselfer found him wandering through his house armed with a screwdriver, looking for loose screws. The neighbor pointed out that this was an inefficient way of maintaining a house. He suggested looking for needed repairs, and then going to his work-

shop for the appropriate tools. The do-it-yourselfer said that this would require too much climbing of stairs. The neighbor persisted. The do-it-yourselfer eventually capitulated and went down to his basement work shop. He returned with a screwdriver in one hand and a file in the other. The curious neighbor followed him through the house and found him looking for loose nails. When he found one, he filed a slot in its head, then inserted the screwdriver and turned it.

It is inefficient to look merely for problems to which one's instruments are applicable; but it is dangerous to distort problems so that one's instruments can be applied. Input-defined professionals have a strong tendency to do just this.

Output-oriented professionals define themselves by their product, the kinds of problems they solve, not by the tools, techniques, and methods they use. These tend to change over time. However, the types of problem they work on do not change. For example, there are professionals who define themselves as producers of compensation or incentive systems, production and inventory control systems, management agencies, »head hunters«, placement services, and auditors also fall into this category.

Output-oriented professionals answer the question, »Where do you intend to go now?« by identifying either the tools, techniques, and methods that will increase their ability to solve the class of problems to which they are dedicated, or to extension of that class of problems. Therefore, the type of their response to this question is not likely to differ substantially from that of input-oriented professionals.

Finally, there are *market-oriented professionals* who define themselves by the class of users they try to serve. They deal with any type of problem these users may have, and, use whatever tools, techniques, and methods appear to be applicable. In market-oriented professions, both the types of problem and the instruments used tend to change radically over time. General practitioners of medicine are a case in point. They treat those who are ill, whatever their illness. Medical specialists, on the other hand, are product-oriented professionals, treating only a specified set of ailments. General purpose management consultants are also market-oriented professionals.

The three types of professionals described here are, of course, »pure« types. Many professionals combine characteristics of two ot three types. Moreover, some professionals change from one type to another

over time. Among them are many who practice Operations Research in the United States.

During World War II, when Operations Research came into existence, and perhaps during the next decade, it was a market-oriented profession. Pure and applied scientists and engineers from a wide variety of disciplines applied themselves to solving whatever problems confronted military officers, and later, corporate executives and public administrators. These scientists and engineers employed a wide variety of instruments, including common sense.

Over time, many Operations Researchers, particularly those in academia, found they could handle certain types of problem more effectively than other. These were problems that involved only machine or machine-like behavior; that is, problems in which human choice and purposeful behavior had no, or an insignificant, role. These problems tended to be operational and tactical in nature, rather than strategic and normative. Among them were production and inventory-control problems; production scheduling, sequencing, and queueing problems; allocation of resources; and competitive, routing, maintenance, and replacement problems. Eventually, Operations Research came to be defined by these types of problems. By the mid 1960s it had evolved into an output-oriented profession.

Corporate management was going through an equally profound transition at the same time. Immediately after the War, corporations in the United States and Europe were confronted with pent-up demand for products that had been in short supply during the War. To meet this demand, production facilities had to be converted from military production and expanded. Therefore, the principal focus of corporate management was on production-related problems. These were problems to which the tools, techniques, and methods of Operations Research could be applied effectively. But by the late 1950s, and certainly by the early 1960s, Western industry had built and converted more production capacity than was required to meet demand.

In the 1960s, competition for what demand there was, and creation of new demand, became the preoccupation of corporate managers. Operations Research was less able to deal with these problems because they involved individual and group choices, purposeful behavior. Most of these choices could not be treated quantitatively, and Operations Researchers were disinclined to use the qualitative theories and vari-

ables needed to explain them. Most of these researchers stayed with the types of problem with which they were familiar and which they could handle with familiar tools, techniques, and methods. The problems Operations Researchers dealt with were relegated to lower levels of management. Operations Research moved down with them.
This demotion continued. In the late 1960s and early 1970s the nature of the problems confronting top corporate management changed again. When the limits of the growth obtainable by manipulating marketing variables were reached, further growth could be obtained only by acquisition and internal development of new products and services. Operations Research was even less applicable to problems of this type than it had been to those in marketing. These problems related to growth and development required strategic planning rather than operational and tactical problem solving. It required dealing with complex systems of interacting problems, *messes,* which could not be formulated as a set of mathematical equations. Systems redesign, not problem solving, was required. Because of its failure to change with the times, Operations Research continued to be moved down in corporations. In many cases it was moved right out.
In the early 1960s almost every major Amrican and European corporation had a corporate Operations Research group. By the late 1970s almost all of these had either moved down in the organization or been eliminated. This devolution was accelerated by the fact that a number of other professions adopted the tools, techniques, and methods employed by Operations Researchers. This was particularly true of MBAs and engineers.
Meanwhile, Operations Research was increasingly taught by instructors who had learned it either from text books or from others who had learned it from text books, not from practice. They taught and wrote about manipulation and development of the tools, techniques, and methods of Operations Research without engaging in professional practice. Because their writings dominate the professional litterature, the profesion came to be defined by its instruments – for example, linear programing, queueing theory, dynamic and integer programming, game theory. By the 1980s, the professional Operations Research journals were almost completely devoid of discussion of real problems. Isolation of Operations Research from the real world is now almost complete.

In the 1970s, awareness of the devolution of Operations Research lead a number of its practitioners to either abandon the field or attempt to redirect it. Their efforts to redirect it failed.

Those who serve, and all professionals serve, should keep their focus on those they serve, not on the service they render nor the instruments used. Professionals should change with the changing needs of their users. User-oriented professionals should go where their users go. Therefore, since I am a user-oriented professional, I have little idea where they, Hence I, will be going from now on, but I intend going there with them. In a world as dynamic as ours I am sure there will be many challenges along the way.

This does not imply that I have no ideas about where management *should* go, nor that I will not make an effort to affect the directions it takes. I mention only a few of these directions here.

1. *Toward more participative management:* involvement of all the relevant stakeholders in decisions that affect them. This involves recognition of the fact that an enterprise or government agency is an instrument of the system that contains it and of those it contains. Serving all its stakeholders is the only justification for its existence. Involvement of stakeholders leads to more ethical behavior.
2. *Toward less bureaucracy and fewer internal service monopolies.* This involves recognition of the fact that a decentralized but regulated market economy is to be preferred to a centrally planned and bureaucratically managed economy, both at the national level and *within an enterprise.*
3. *Toward less supervision of subordinates, less management of their actions, and more management of the interactions of the unit managed with other units:* creation of work environments and provision of support that enable subordinates to manage themselves.
4. *Toward more effective planning:* planning that is directed at creating a desirable future, not merely one that reacts to a forecast future believed to be beyond control. Planning should be driven by an explicit design of what the organization would be *now,* if it could be whatever it wanted.
5. *Toward more understanding, not merely knowledge, of what is happening within the organization and in its environment.* Knowledge is contained in instructions, answers to 'how-to' questions; understanding is contained in explanations, answers to "why" questions. Most

managers have a great deal of information, some knowledge, and very little understanding.

6. *Toward more rapid and effective individual and organizational learning and adaption:* development of feedback control of the implementation of decisions, the expected effects of decisions, and the assumptions on which these expectations are based. Such control should also be extended to those decisions made in the control process. Put another way: management should be based on experiment rather than experience.
7. *Toward development rather than growth.* Growth is an increase in size or number. Development is an increase in the desire and ability to satisfy one's own needs and desires, and those others. Growth and development can occur independently of each other. Many managers take them to be the same thing. Growth is justifiable only when it enhances development.
8. *Toward more creativity in management.* Creativity is the ability to (1) identify self-imposed constraints, (2) remove them, and (3) explore the consequences of their removal. It is through creativity that apparently externally imposed constraints are converted to ones that are perceived as internally imposed, hence subject to ones that are perceived as internally imposed, hence subject to removal or circumvention. It is through creativity that people can recognize and remove themselves as the principal obstruction between where they are and where they most want to be.

This is where I *hope* to go from now, but I *intend* to go wherever those whom I seek to serve take me.