

*Innovating organizations—those that are designed to do something for the first time—call for unique structures, information and decision processes, and reward and people-selection systems.*

# Designing the Innovating Organization

Jay R. Galbraith

Innovation is in. New workable, marketable ideas are being sought and promoted these days as never before in the effort to restore U.S. leadership in technology, in productivity growth, and in the ability to compete in the world marketplace. Innovative methods for conserving energy and adapting to new energy sources are also in demand.

The popular press uses words like *revitalization* to capture the essence of the issue. The primary culprit of our undoing, up until now, has been management's short-run earnings focus. However, even some patient

managers with long-term views are finding that they cannot buy innovation. They cannot exhort their operating organizations to be more innovative and creative. Patience, money, and a supportive leadership are not enough. It takes more than these things to achieve innovation.

It is my contention that innovation requires an organization specifically designed for that purpose—that is, such an organization's structure, processes, rewards, and people must be combined in a special way to create an innovating organization, one that is

designed to do something for the first time. The point to be emphasized here is that the innovating organization's components are completely different from and often contrary to those of existing organizations, which are generally operating organizations. The latter are designed to efficiently process the millionth loan, produce the millionth automobile, or serve the millionth client. An organization that is designed to do something well for the millionth time is not good at doing something for the first time. Therefore, organizations that want to innovate or revitalize themselves need two organizations, an operating organization and an innovating organization. In addition, if the ideas produced by the innovating organization are to be implemented by the operating organization, they need a transition process to transfer ideas from the innovating organization to the operating organization.

This article will describe the components of an organization geared to producing innovative ideas. Specifically, in the next section of this article, I describe a case history that illustrates the components required for successful innovation. Then I will explore the lessons to be learned from this case history by describing the role structure, the key processes, the reward systems, and the people practices that characterize an innovating organization.

#### THE INNOVATING PROCESS

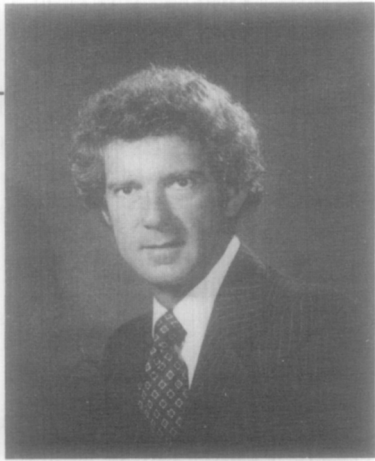
Before I describe the typical process by which innovations occur in organizations, we must understand what we are discussing. What is innovation? How do we distinguish between invention and innovation? Invention is the creation of a new idea. Innovation is the process of applying a new idea to create a new process or product. Invention occurs more frequently than innovation. In addition, the kind of innovation in which we

are interested here is the kind that becomes necessary to implement a new idea that is not consistent with the current concept of the organization's business. Many new ideas that are consistent with an organization's current business concept are routinely generated in some companies. Those are not our current concern; here we are concerned with implementing inventions that are good ideas but do not quite fit into the organization's current mold. Industry has a poor track record with this type of innovation. Most major technological changes come from outside an industry. The mechanical typewriter manufacturers did not introduce the electric typewriter; the electric typewriter people did not invent the electronic typewriter; vacuum tube companies did not introduce the transistor, and so on. Our objective is to describe an organization that will increase the odds that such nonroutine innovations can be made. The following case history of a nonroutine innovation presents a number of lessons that illustrate how we can design an innovating organization.

#### THE CASE HISTORY

The organization in question is a venture that was started in the early seventies. While working for one of our fairly innovative electronics firms, a group of engineers developed a new electronics product. However, they were in a division that did not have the charter for their product. The ensuing political battle caused the engineers to leave and form their own company. They successfully found venture capital and introduced their new product. Initial acceptance was good, and within several years their company was growing rapidly and had become the industry leader.

However, in the early 1970s Intel invented the microprocessor, and by the mid-to-late seventies, this innovation had



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spread through the electronics industries. Manufacturers of previously "dumb" products now had the capability of incorporating intelligence into their product lines. A com-

petitor who understood computers and software introduced just such a product into our new venture firm's market, and it met with high acceptance. The firm's president responded by hiring someone who knew something about microcomputers and some software people and instructing the engineering department to respond to the need for a competing product.

The president spent most of his time raising capital to finance the venture's growth. But when he suddenly realized that the engineers had not made much progress, he instructed them to get a product out quickly. They did, but it was a half-hearted effort. The new product incorporated a microprocessor but was less than the second-generation product that was called for.

Even though the president developed markets in Europe and Singapore, he noticed that the competitor continued to grow faster than his company and had started to steal a share of his company's market. When the competitor became the industry leader, the president decided to take charge of the product-development effort. However, he found that the hardware proponents and software proponents in the engineering department were locked in a political battle. Each group felt that its "magic" was the more powerful. Unfortunately, the lead engineer (who was a co-founder of the firm) was a hardware proponent, and the hardware establishment prevailed. However, they then clashed head-on with the marketing department, which agreed with the software proponents. The conflict resulted in studies and presentations, but no new product. So here was a young, small (1,200 people) entrepreneurial firm that could not innovate even though the president wanted innovation and provided resources to produce it. The lesson is that more was needed.

As the president became more deeply involved in the problem, he received 7

a call from his New England sales manager, who wanted him to meet a field engineer who had modified the company's product and programmed it in a way that met customer demands. The sales manager suggested, "We may have something here."

Indeed, the president was impressed with what he saw. When the engineer had wanted to use the company's product to track his own inventory, he wrote to company headquarters for programming instructions. The response had been: It's against company policy to send instructional materials to field engineers. Undaunted, the engineer bought a home computer and taught himself to program. He then modified the product in the field and programmed it to solve his problem. When the sales manager happened to see what was done, he recognized its significance and immediately called the president.

The field engineer accompanied the president back to headquarters and presented his work to the engineers who had been working on the second-generation product for so long. They brushed off his efforts as idiosyncratic, and the field engineer was thanked and returned to the field.

A couple of weeks later the sales manager called the president again. He said that the company would lose this talented guy if something wasn't done. Besides, he thought that the field engineer, not engineering, was right. While he was considering what to do with this ingenious engineer, who, on his own had produced more than the entire engineering department, the president received a request from the European sales manager to have the engineer assigned to him.

The European sales manager had heard about the field engineer when he visited headquarters, and had sought him out and listened to his story. The sales manager knew that a French bank wanted the type of

ated for himself; a successful application would be worth an order for several hundred machines. The president gave the go-ahead and sent the field engineer to Europe. The engineering department persisted in their view that the program wouldn't work. Three months later, the field engineer successfully developed the application, and the bank signed the order.

When the field engineer returned, the president assigned him to a trusted marketing manager who was told to protect him and get a product out. The engineers were told to support the manager and reluctantly did so. Soon they created some applications software and a printed circuit board that could easily be installed in all existing machines in the field. The addition of this board and the software temporarily saved the company and made its current product slightly superior to that of the competitor.

Elated, the president congratulated the young field engineer and gave him a good staff position working on special assignments to develop software. Then problems arose. When the president tried to get the personnel department to give the engineer a special cash award, they were reluctant. "After all," they said, "other people worked on the effort, too. It will set a precedent." And so it went. The finance department wanted to withhold \$500 from the engineer's pay because he had received a \$1,000 advance for his European trip, but had turned in vouchers for only \$500.

The engineer didn't help himself very much either; he was hard to get along with and refused to accept supervision from anyone except the European sales manager. When the president arranged to have him permanently transferred to Europe on three occasions, the engineer changed his mind about going at the last minute. The president is still wondering what to do with him.

There are a number of lessons about the needs of an innovative organiza-

tion in this not uncommon story. The next section elaborates on these lessons.

#### THE INNOVATING ORGANIZATION

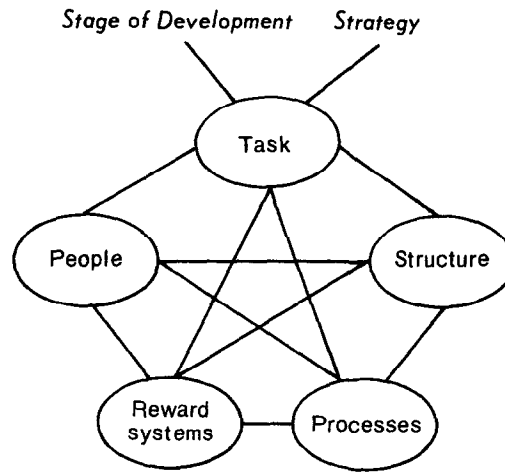
Before we can draw upon the case history's lessons, it is important to note that the basic components of the innovating organization are no different from those of an operating organization. That is, both include a task, a structure, processes, reward systems, and people, as shown in Figure 1. Figure 2 compares the design parameters of the operating organization's components with those of the innovating organization's components.

This figure shows that each component must fit with each of the other components and with the task. A basic premise of this article is that the task of the innovating organization is fundamentally different from that of the operating organization. The innovating task is more uncertain and risky, takes place over longer time periods, assumes that failure in the early stages may be desirable, and so on. Therefore, the organization that performs the innovative task should also be different. Obviously, a firm that wishes to innovate needs both an operating organization and an innovating organization. Let's look at the latter.

#### STRUCTURE OF THE INNOVATING ORGANIZATION

The structure of the innovating organization encompasses these elements: (1) people to fill three vital roles—idea generators, sponsors, and orchestrators; (2) differentiation, a process that differentiates or separates the innovating organization's activities from those of the operating organization; and (3) "reservations," the means by which the separation occurs—and this may be accomplished physically, financially, or organizationally.

Figure 1  
ORGANIZATION DESIGN COMPONENTS



The part that each of these elements plays in the commercialization of a new idea can be illustrated by referring to the case history.

#### Roles

Like any organized phenomenon, innovation is brought about through the efforts of people who interact in a combination of roles. Innovation is not an individual phenomenon. People who must interact to produce a commercial product—that is, to innovate in the sense we are discussing—play their roles as follows:

- Every innovation starts with an *idea generator* or *idea champion*. In the above example, the field engineer was the person who generated the new idea—that is, the inventor, the entrepreneur, or risk taker on whom much of our attention has been focused. The case history showed that an idea champion is needed at each stage of an idea's or an invention's development into an innovation. That is, at each stage there must be a dedicated, full-time individual whose

Figure 2  
COMPARISON OF COMPONENTS OF OPERATING AND INNOVATING ORGANIZATIONS

	<i>Operating Organization</i>	<i>Innovating Organization</i>
<i>Structure</i>	Division of labor Departmentalization Span of control Distribution of power	Roles: Orchestrator Sponsor Idea generator (champion) Differentiation Reservations
<i>Processes</i>	Providing information and communication Planning and budgeting Measuring performance Linking departments	Planning/funding Getting ideas Blending ideas Transitioning Managing programs
<i>Reward systems</i>	Compensation Promotion Leader style Job design	Opportunity/autonomy Promotion/recognition Special compensation
<i>People</i>	Selection/recruitment Promotion/transfer Training/development	Selection/self-selection Training/development

success or failure depends on developing the idea. The idea generator is usually a low-level person who experiences a problem and develops a new response to it. The lesson here is that many ideas originate down where "the rubber meets the road." The low status and authority level of the idea generator creates a need for someone to play the next role.

- Every idea needs at least one *sponsor* to promote it. To carry an idea through to implementation, someone has to discover it and fund the increasingly disruptive and expensive development and testing efforts that shape it. Thus idea generators need to find sponsors for their ideas so they can perfect them. In our example, the New England sales manager, the European sales manager, and finally the marketing manager all sponsored the field engineer's idea. Thus one of the sponsor's functions is to lend his or her authority and resources to an idea to

carry the idea closer to commercialization.

The sponsor must also recognize the business significance of an idea. In any organization, there are hundreds of ideas being promoted at any one time. The sponsor must select from among these ideas those that might become marketable. Thus it is best that sponsors be generalists. (However, that is not always the case, as our case history illustrates.)

Sponsors are usually middle managers who may be anywhere in the organization and who usually work for both the operating and the innovating organization. Some sponsors run divisions or departments. They must be able to balance the operating and innovating needs of their business or function. On the other hand, when the firm can afford the creation of venture groups, new product development departments, and the like, sponsors may work full time for the innovating organization. In the

case history, the two sales managers spontaneously became sponsors and the marketing manager was formally designated as a sponsor by the president. The point here is that by formally designating the role or recognizing it, funding it with monies earmarked for innovation, creating innovating incentives, and developing and selecting sponsorship skills, the organization can improve its odds of coming up with successful innovations. Not much attention has been given to sponsors, but they need equal attention because innovation will not occur unless there are people in the company who will fill all three roles.

- The third role illustrated in the case history is that of the *orchestrator*. The president played this role. An orchestrator is necessary because new ideas are never neutral. Innovative ideas are destructive; they destroy investments in capital equipment and people's careers. The management of ideas is a political process. The problem is that the political struggle is biased toward those in the establishment who have authority and control of resources. The orchestrator must balance the power to give the new idea a chance to be tested in the face of a negative establishment. The orchestrator must protect idea people, promote the opportunity to try out new ideas, and back those whose ideas prove effective. This person must legitimize the whole process. That is what the president did with the field engineer; before he became involved, the hardware establishment had prevailed. Without an orchestrator, there can be no innovation.

To play their roles successfully, orchestrators use the processes and rewards to be described in the following sections. That is, a person orchestrates by funding innovating activities and creating incentives for middle managers to sponsor innovating ideas. Orchestrators are the organization's top managers, and they must design the innovating organization.

The typical operating role structure of a divisionalized firm is shown in Figure 3. The hierarchy is one of the operating functions reporting to division general managers who are, in turn, grouped under group executives. The group executives report to the chief executive officer (CEO). Some of these people play roles in both the operating and the innovating organization.

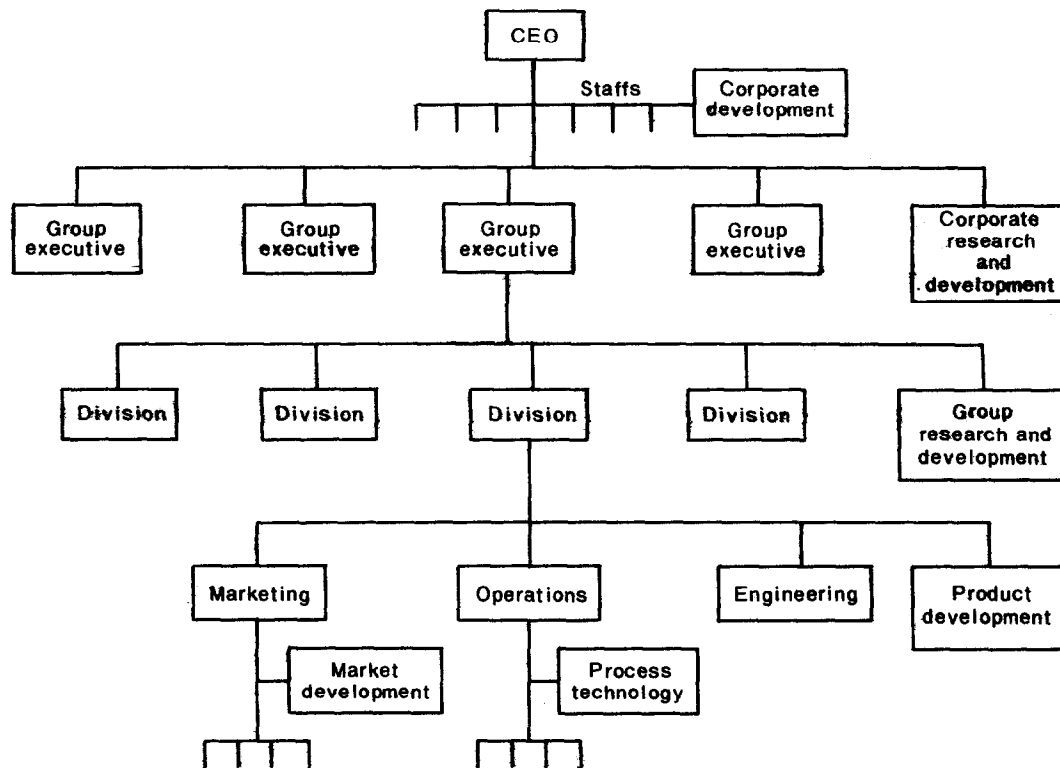
The innovating organization's role structure is shown in Figure 4. The chief executive and a group executive function as orchestrators. Division managers are the sponsors who work in both the operating and the innovating organizations. In addition, several reservations are created in which managers of research and development (R&D), corporate development, product development, market development, and new process technology function as full-time sponsors. These reservations allow the separation of innovating activity from the operating activity. This separation is an organizing choice called differentiation. It is described next.

### *Differentiation*

In the case history we saw that the innovative idea perfected at a remote site was relatively advanced before it was discovered by management. The lesson to be learned from this is that if one wants to stimulate new ideas, the odds are better if early efforts to perfect and test new "crazy" ideas are differentiated—that is, separated—from the functions of the operating organization. Such differentiation occurs when an effort is separated physically, financially, and/or organizationally from the day-to-day activities that are likely to disrupt it. If the field engineer had worked within the engineering department or at company headquarters, his idea probably would have been snuffed out prematurely.

Another kind of differentiation can

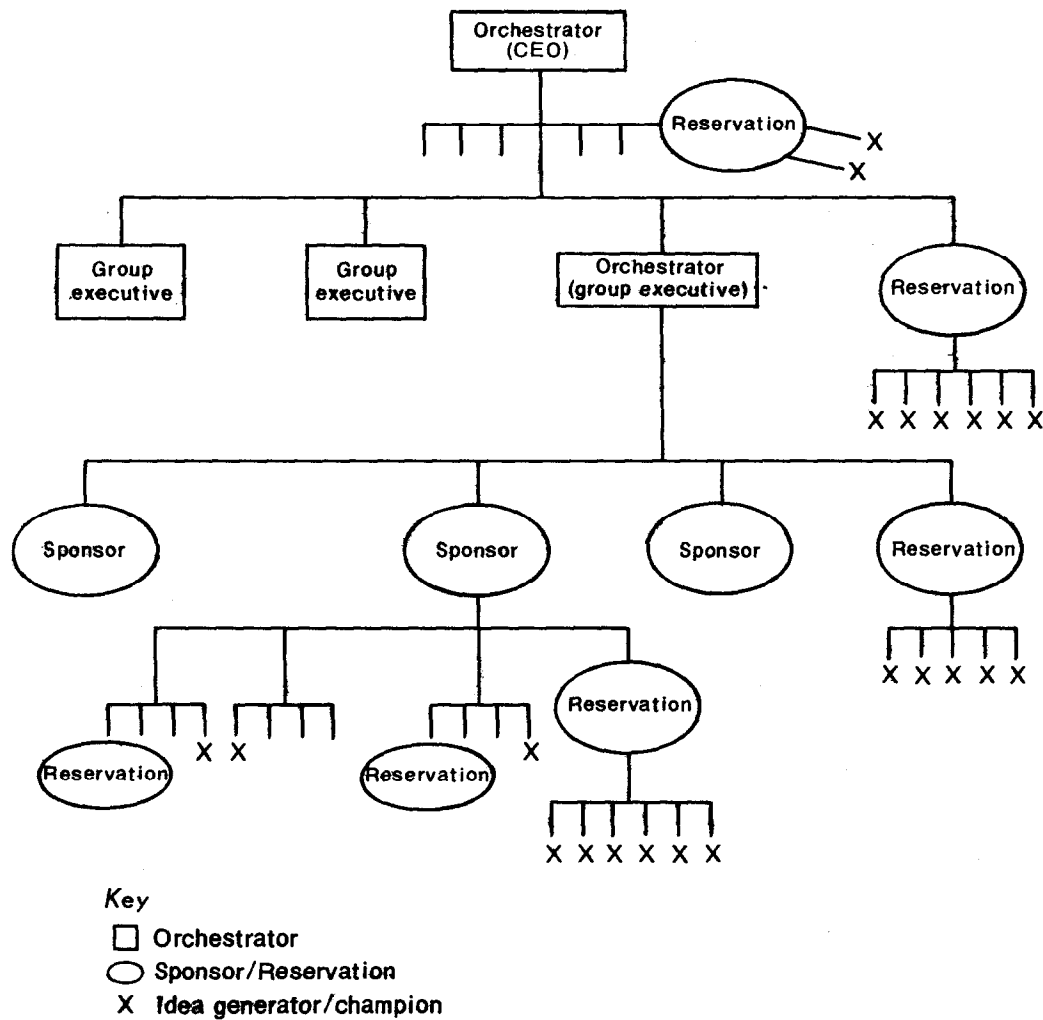
Figure 3  
TYPICAL OPERATING STRUCTURE OF DIVISIONALIZED FIRM



be accomplished by freeing initial idea tests from staff controls designed for the operating organization. The effect of too much control is illustrated by one company in which a decision on whether to buy an oscilloscope took about 15 to 30 minutes (with a shout across the room) before the company was acquired by a larger organization. After the acquisition, that same type of decision took 12 to 18 months because the purchase required a capital appropriation request. Controls based on operating logic reduce the innovating organization's ability to rapidly, cheaply, and frequently test and modify new ideas. Thus, the more differentiated an initial effort is, the greater the likelihood of innovation.

however, is that it decreases the likelihood that a new proven idea will be transferred back to the operating organization. Herein lies the differentiation/transfer dilemma: The more differentiated the effort, the greater the likelihood of producing a new business idea, but the less likelihood of transferring the new idea into the operating organization for implementation. The dilemma occurs only when the organization needs both invention and transfer. That is, some organizations may not need to transfer new ideas to the operating organization. For example, when Exxon started its information systems business, there was no intention to have the petroleum company run this area of business. Exxon innovators had to grow their own operating organizations; therefore, they could

Figure 4  
AN INNOVATING ROLE STRUCTURE  
(differentiation)



maximize differentiation in the early phases. Alternatively, when Intel started work on the 64K RAM (the next generation of semiconductor memories, this random access memory holds roughly 64,000 bits of information), the effort was consistent with their current business and the transfer into fabrication and sales was critical. Therefore, the development effort was only minimally sep-

arated from the operating division that was producing the 16K RAM. The problem becomes particularly difficult when a new product or process differs from current ones, but must be implemented through the current manufacturing and sales organizations. The greater the need for invention and the greater the difference between the new idea and the existing business concept, the greater

the degree of differentiation required to perfect the idea. The only way to accomplish both invention and transfer is to proceed stagewise. That is, differentiate in the early phases and then start the transition process before development is completed so that only a little differentiation is left when the product is ready for implementation. The transition process is described in the section on key processes (page 15).

In summary, invention occurs best when initial efforts are separated from the operating organization and its controls—because innovating and operating are fundamentally opposing logics. This kind of separation allows both to be performed simultaneously and prevents the establishment from prematurely snuffing out a new idea. The less the dominant culture of the organization supports innovation, the greater is the need for separation. Often this separation occurs naturally as in the case history, or clandestinely, as in “bootlegging.” If a firm wants to foster innovation, it can create reservations where innovating activity can occur as a matter of course. Let us now turn to this last structural parameter.

### *Reservations*

Reservations are organizational units, such as R&D groups, that are totally devoted to creating new ideas for future business. The intention is to reproduce a garage-like atmosphere where people can rapidly and frequently test their ideas. Reservations are havens for “safe learning.” When innovating, one wants to maximize early failure to promote learning. On reservations that are separated from operations, this cheap, rapid screening can take place.

Reservations permit differentiation to occur by housing people who work solely for the innovating organization and by having a reservation manager who works full

within divisions and/or at corporate headquarters to permit various degrees of differentiation.

Reservations can be internal or external. Internal reservations may include some staff and research groups, product and process development labs, and groups that are devoted to market development, new ventures, and/or corporate development. They are organizational homes where idea generators can contribute without becoming managers. Originally, this was the purpose of staff groups, but staff groups now frequently assume control responsibilities or are narrow specialists who contribute to the current business idea. Because such internal groups can be expensive, outside reservations like universities, consulting firms, and advertising agencies are often used to tap nonmanagerial idea generators.

Reservations can be permanent or temporary. The internal reservations described above, such as R&D units, are reasonably permanent entities. Others can be temporary. Members of the operating organization may be relieved of operating duties to develop a new program, a new process, or a new product. When developed, they take the idea into the operating organization and resume their operating responsibilities. But for a period of time they are differentiated from operating functions to varying degrees in order to innovate, fail, learn, and ultimately perfect a new idea.

Collectively the roles of orchestrators, sponsors, and idea generators working with and on reservations constitute the structure of the innovating organization. Some of the people, such as sponsors and orchestrators, play roles in both organizations; reservation managers and idea generators work only for the innovating organization. Virtually everyone in the organization can be an idea generator, and all middle managers are potential sponsors. However not all choose to play these roles. People vary

considerably in their innovating skills. By recognizing the need for these roles, developing people to fill them, giving them opportunity to use their skills in key processes, and rewarding innovating accomplishments, the organization can do considerably better than just allowing a spontaneous process to work. Several key processes are part and parcel of this innovating organizational structure. These are described in the next section.

#### KEY PROCESSES

In our case history, the idea generator and the first two sponsors found each other through happenstance. The odds of such propitious match-ups can be significantly improved through the explicit design of processes that help sponsors and idea generators find each other. The chances of successful match-ups can be improved by such funding, getting ideas, and blending ideas. In addition, the processes of transitioning and program management move ideas from reservations into operations. Each of these is described below.

##### *Funding*

A key process that increases our ability to innovate is a funding process that is explicitly earmarked for the innovating organization. A leader in this field is Texas Instruments

(TI), a company that budgets and allocates funds for both operating and innovating. In essence the orchestrators make the short-run/long-run tradeoff at this point. They then orchestrate by choosing where to place the innovating funds—with division sponsors or corporate reservations. The funding process is a key tool for orchestration.

Another lesson to be learned from the case history is that it frequently takes more than one sponsor to launch a new idea. The field engineer's idea would never have been brought to management's attention without the New England sales manager. It would never have been tested in the market without the European sales manager. Multiple sponsors keep fragile ideas alive. If engineering had been the only available sponsor for technical ideas, there would have been no innovation.

Some organizations purposely create a multiple sponsoring system and make it legitimate for an idea generator to go to any sponsor who has funding for new ideas. Multiple sponsors duplicate the market system of multiple bankers for entrepreneurs. At Minnesota Mining and Manufacturing (3M), for example, an idea generator can go to his or her division sponsor for funding. If refused, the idea generator can then go to any other division sponsor or even to corporate R&D. If the idea is outside current business lines, the idea generator can go to the new ventures group for support. If the idea is

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*"[I]nvention occurs best when initial efforts are separated from the operating organization and its controls—because innovating and operating are fundamentally opposing logics."*

rejected by all possible sponsors, it probably isn't a very good idea. However, the idea is kept alive and given several opportunities to be tested. Multiple sponsors keep fragile young ideas alive.

### *Getting Ideas*

The process of getting ideas occurs by happenstance as it did in the case history. The premise of this section is that the odds of match-ups between idea generators and sponsors can be improved by organization design. First, the natural process can be improved by network-building actions such as multidivision or multireservation careers or company-wide seminars and conferences. All of these practices plus a common physical location facilitate matching at 3M.

The matching process is formalized at TI, where there is an elaborate planning process called the objectives, strategies and tactics or OST system, which is an annual harvest of new ideas. Innovating funds are distributed to managers of objectives (sponsors) who fund projects based on ideas formulated by idea generators, and these then become tactical action programs. Ideas that are not funded go into a creative backlog to be tapped throughout the year. Whether formal, as at TI, or informal, as at 3M, it is noteworthy that these are known systems for matching ideas with sponsors.

Ideas can also be acquired by aggressive sponsors. Sponsors sit at the crossroads of many ideas and often arrive at a better idea by putting two or more together. They can then pursue an idea generator to champion it. Good sponsors know where the proven idea people are located and how to attract such people to come to perfect an idea on their reservation. Sponsors can go inside or outside the organization to pursue these idea people.

And finally, formal events for matching purposes can be scheduled. At 3M,

for example, there's an annual fair at which idea generators can set up booths to be viewed by shopping sponsors. Exxon Enterprises held a "shake the tree event" at which idea people could throw out ideas to be pursued by attending sponsors. The variations of such events are endless. The point is that by devoting time to ideas and making innovation legitimate, the odds that sponsors will find new ideas are increased.

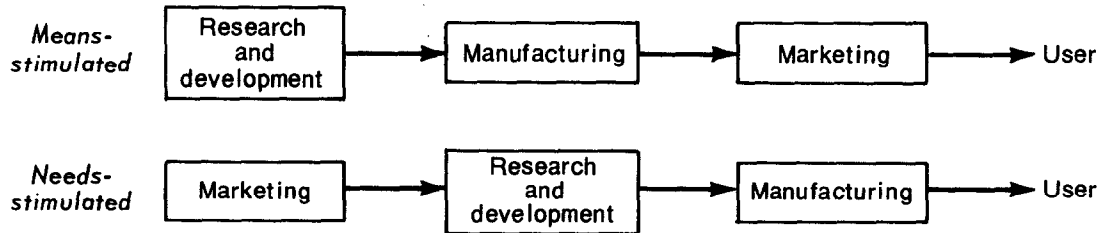
### *Blending Ideas*

An important lesson to be derived from our scenario is that it is no accident that a field engineer produced the new product idea. Why? Because the field engineer spent all day working on customer problems and also knew the technology. Therefore, one person knew the need and the means by which to satisfy that need. (An added plus: The field engineer had a personal need to design the appropriate technology.) The premise here is that innovation is more likely to occur when knowledge of technologies and user requirements are combined in the minds of as few people as possible – preferably in that of one person.

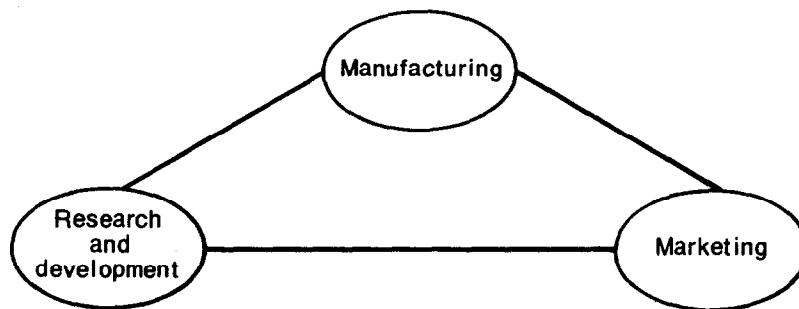
The question of whether innovations are need-stimulated or means-stimulated is debatable. Do you start with the disease and look for a cure, or start with a cure and find a disease for it? Research indicates that two-thirds of innovations are need-stimulated. But this argument misses the point. As shown in Figure 5(a), the debate is over whether use or means drives the downstream efforts. This thinking is linear and sequential. Instead, the model suggested here is shown in Figure 5(b). That is, for innovation to occur, knowledge of all key components is simultaneously coupled. And the best way to maximize communication among the components is to have the communication occur intrapersonally – that is, within one person's mind. If this is impossible, then as

Figure 5  
 LINEAR SEQUENTIAL COUPLING COMPARED WITH SIMULTANEOUS COUPLING OF KNOWLEDGE

(a) *Linear Sequential Coupling*



(b) *Simultaneous Coupling*



few people as possible should have to communicate or interact. The point is that innovative ideas occur when knowledge of the essential specialties is coupled in as few heads as possible. To encourage such coupling, the organization can grow or select individuals with the essential skills or it can encourage interaction between those with meshing skills. These practices will be discussed in a people section.

A variety of processes are employed by organizations to match knowledge of need and of means. At IBM they place marketing people directly in the R&D labs where they can readily interpret the market requirement documents for researchers. People are rotated through this unit, and a network is created. Wang holds an annual users' conference at which customers and product designers interact and discuss the use of Wang products. Lanier insists that all

top managers, including R&D management, spend one day a month selling in the field. It is reported that British scientists made remarkable progress on developing radar after actually flying missions with the Royal Air Force. In all these cases there is an explicit matching of the use and the user with knowledge of a technology to meet the use. Again these processes are explicitly designed to get a user orientation among the idea generators and sponsors. They increase the likelihood that inventions will be innovations. The more complete a new idea or invention is at its inception, the greater the likelihood of its being transferred into the operating organization.

*Transitioning*

Perhaps the most crucial process in getting an innovative product to market is the tran-

Figure 6  
TRANSITIONING IDEAS BY STAGES

Choices	Stages			
	I	II	Nth	Implementation
Sponsor	Corporate	Corporate	...	Division
Champion	Corporate	Corporate	...	Division
Staffing	Corporate	Corporate-division	...	Division
Location	Corporate	Corporate	...	Division
Funding	Corporate	Corporate	...	Division
Autonomy	Complete	Complete	...	Minimal

sitioning of an idea from a reservation to an operating organization for implementation. This process occurs in stages, as illustrated in the case history. First, the idea was formulated in the field before management knew about it. Then it was tested with a customer, the French bank. And finally, at the third stage, development and full-scale implementation took place. In other cases, several additional stages of testing and scale-up may be necessary. In any case, transitioning should be planned in such stages. At each stage the orchestrator has several choices that balance the need for further invention with the need for transfer. The choices and typical stages of idea development are shown in Figure 6.

At each stage these choices face the orchestrator: Who will be the sponsor? Who will be the champion? Where can staff be secured for the effort? At what physical location will work be performed? Who will fund the effort? How much autonomy should the effort have, or how differentiated should it be? For example, at the initial new idea formulation stage the sponsor could be the corporate ventures group with the champion working on the corporate reservation. The effort could be staffed with other corporate reservation types and funded at the corporate level. The activity would be fully separate and autonomous. If the results were

positive, the process could proceed to the next stage. If the idea needed further development, some division people could be brought in to round out the needed specialties. If the data were still positive after the second stage, then the effort could be transferred physically to the division, but the champion, sponsor, and funding might remain at the corporate level. In this manner, by orchestrating through choices of sponsor, champion, staff, location, funding, and autonomy, the orchestrator balances the need for innovation and protection with the need for testing against reality and transfer.

The above is an all-too-brief outline of the transition process; entire books have been written on the subject of technology transfer. The goal here is to highlight the stagewise nature of the process and the decisions to be made by the orchestrator at each stage. The process is crucial because it is the link between the two organizations. Thus to consistently innovate, the firm needs an innovating organization, an operating organization, and a process for transitioning ideas from the former to the latter.

#### *Managing Programs*

Program management is necessary to implement new products and processes within divisions. At this stage of the process, the idea generator usually hands the idea off to a

product/project/program manager. The product or process is then implemented across the functional organization within the division. The systems and organizational processes for managing projects have been discussed elsewhere and will not be discussed here. The point is that a program management process and skill is needed.

In summary, several key processes—that is, funding, getting ideas, blending ideas, transitioning, and managing programs—are basic components of the innovating structure. Even though many of these occur naturally in all organizations, our implicit hypothesis is that the odds for successful innovation can be increased by explicitly designing these processes and by earmarking corporate resources for them. Hundreds of people in organizations choose to innovate voluntarily, as did the field engineer in the case history. However, if there were a reward system for people like these, more would choose to innovate, and more would choose to stay in the organization to do their innovating. The reward system is the next component to be described.

#### REWARD SYSTEM

The innovating organization, like the operating organization, needs an incentive system to motivate innovating behavior. Because the task of innovating is different from that of operating, the innovating organization needs a different reward system. The innovating task is riskier, more difficult, and takes place over longer time frames. These factors call for some adjustment of the operating organization's reward system, the amount of adjustment depending on how innovative the operating organization is and how attractive outside alternatives are.

The functions of the reward system are threefold: First, the rewards must attract idea people to the company and the reserva-

tions and retain them. Because various firms have different attraction and retention problems, their reward systems must vary. Second, the rewards provide motivation for the extra effort needed to innovate. After 19 failures, for example, something has to motivate the idea generator to make the 20th attempt. And, finally, successful performance deserves a reward. These rewards are primarily for idea generators. However, a reward-measurement system for sponsors is equally important. Various reward systems will be discussed in the next sections.

#### *Rewards for Idea Generators*

Reward systems mix several types of internal motivators, such as the opportunity to pursue one's ideas, promotions, recognition, systems, and special compensation. First, people can be attracted and motivated intrinsically by simply giving them the opportunity and autonomy to pursue their own ideas. A reservation can provide such opportunity and autonomy. Idea people—who are internally driven—such as the field engineer in our story can come to a reservation, pursue their own ideas, and be guided and evaluated by a reservation manager. This is a reward in itself, albeit a minimal reward. If that minimal level attracts and motivates idea people, the innovating organization need go no further in creating a separate reward system.

However, if necessary, motivational leverage can be obtained by promotion and recognition for innovating performance. The dual ladder—that is, a system whereby an individual contributor can be promoted and given increased salary without taking on managerial responsibilities—is the best example of such a system. At 3M a contributor can rise in both status and salary to the equivalent of a group executive without becoming a manager. The dual ladder has always existed in R&D, but it is now being ex-

tended to some other functions as well.

Some firms grant special recognition for high career performance. IBM has its IBM fellows program in which the person selected as a fellow can work on projects of his or her own choosing for five years. At 3M, there is the Carlton Award, which is described as an internal Nobel Prize. Such promotion and recognition systems reward innovation and help create an innovating culture.

When greater motivation is needed, and/or the organization wants to signal the importance of innovation, special compensation is added to the aforementioned systems. Different special compensation systems will be discussed in the order of increasing motivational impact and of increasing dysfunctional ripple effects. The implication is that the firm should use special compensation only to the degree that the need for attraction and for motivation dictate.

Some companies reward successful idea generators with one-time cash awards. For example, International Harvester's share of the combine market jumped from 12 percent to 17 percent because of the introduction of the axial flow combine. The scientist whose six patents contributed to the product development was given \$10,000. If the product continues to succeed, he may be given another award. IBM uses the "Chairman's Outstanding Contribution Award." The current program manager on the 4300 series was given a \$5,000 award for her breakthrough in coding. These awards are made after the idea is successful and primarily serve to reward achievement rather than to attract innovators and provide incentive for future efforts.

Programs that give a "percentage of the take" to the idea generator and early team members provide even stronger motivation. Toy and game companies give a royalty to inventors—both internal and external—of toys and games they produce. Apple

Computer claims to give royalties to employees who write software programs that will run on Apple equipment. A chemical company created a pool by putting aside 4 percent of the first five years' earnings from a new business venture, which was to be distributed to the initial venture team. Other companies create pools from percentages that range from 2 to 20 percent of cost savings created by process innovations. In any case, a predetermined contract is created to motivate the idea generator and those who join a risky effort at an early stage.

The most controversial efforts to date are attempts to duplicate free-market rewards within the firm. For example, a couple of years ago, ITT bought a small company named Qume that made high-speed printers. The founder became a millionaire from the sale; he had to quit his previous employer to found the venture capital effort to start Qume. If ITT can make an outsider a millionaire, why not give the same chance to entrepreneurial insiders? Many people advocate such a system but have not found an appropriate formula to implement the idea. For example, one firm created five-year milestones for a venture, the accomplishment of which would result in a cash award of \$6 million to the idea generator. However, the business climate changed after two years, and the idea generator, not surprisingly, tried to make the plan work rather than adapt to the new, unforeseen reality.

Another scheme is to give the idea generator and the initial team some phantom stock, which gets evaluated at sale time in the same way that any acquisition would be evaluated. This process duplicates the free-market process and gives internal people the same venture capital opportunities and risks as they would have on the outside.

The special compensation programs produce motivation and dysfunctions. People who contribute at later stages frequently feel like second-class citizens.

Also, any program that discriminates will create perceptions of unfair treatment and possible fallout in the operating organization. If the benefits are judged to be worth the effort, however, care should be taken to manage the fallout.

#### *Rewards for Sponsors*

The case history also demonstrates that sponsors need incentives, too. In the example, because they were being beaten in the market, the sales people had an incentive to adopt a new product. The point is that sponsors will sponsor ideas, but these may not be innovating ideas unless there's something in it for them. The orchestrator's task is to create and communicate those incentives.

Sponsor incentives take many forms. At 3M, division managers have a bonus goal that is reached if 25 percent of their revenue comes from products introduced within the previous five years. When the percentage falls below the goal, and the bonus is threatened, these sponsors become amazingly receptive to new product ideas. The transfer process becomes much easier as a result. Sales growth, revenue increase, numbers of new products, and so on, may be the bases for incentives that motivate sponsors.

Another controversy can arise if the idea generators receive phantom stock. Should the sponsors who supervise these idea people receive phantom stock, too? Some banks have created separate subsidiaries so that sponsors can receive stock in the new venture. To the degree that sponsors contribute to idea development, they will need to be given such stock options, too.

Thus, the innovating organization needs reward systems for both idea generators and sponsors. It should start with a simple reward system and move to more motivating, more complex, and possibly more upsetting types of rewards only if and when

attraction and motivation problems call for them.

#### PEOPLE

The final policy area to be considered involves people practices. The assumption is that some people who are better at innovating are not necessarily good at operating. Therefore, the ability of the innovating organization to generate new business ideas can be increased by systematically developing and selecting those people who are better at innovating than others. But first the desirable attributes must be identified. These characteristics that identify likely idea generators and sponsors are spelled out in the following sections.

#### *Attributes of Idea Generators*

The field engineer in our case history is the stereotype of the inventor. He is not mainstream. He's hard to get along with, and he wasn't afraid to break company policy to perfect his idea. Such people have strong egos that allow them to persist and swim upstream. They generally are not the type of people who get along well in an organization. However, if an organization has reservations, innovating funds, and dual ladders, these people can be attracted and retained.

The psychological attributes of successful entrepreneurs include great need to achieve and to take risks. But, to translate that need into innovation, several other attributes are needed. First, prospective innovators have an irreverence for the status quo. They often come from outcast groups or are newcomers to the company; they are less satisfied with the way things are and have less to lose if there's a change. Successful innovators also need "previous programming in the industry"—that is, an in-depth knowledge of the industry gained through

either experience or formal education. Hence, the innovator needs industry knowledge, but not the religion.

Previous startup experience is also associated with successful business ventures. As are people who come from incubator firms (for example high-technology companies) and areas (such as Boston and the Silicon Valley) that are noted for creativity.

The amount of organizational effort needed to select these people varies with the ability to attract them to the organization in the first place. If idea people are attracted through reputation, then by funding reservations and employing idea-getting processes, idea people will, in effect, select themselves—they will want to work with the organization—and over time their presence will reinforce the organization's reputation for idea generation. If the firm has no reputation for innovation, then idea people must be sought out or external reservations established to encourage initial idea generation. One firm made extensive use of outside recruiting to accomplish such a goal. A sponsor would develop an idea and then attend annual conferences of key specialists to determine who was most skilled in the area of interest; he or she would then interview appropriate candidates and offer the opportunity to develop the venture to those with entrepreneurial interests.

Another key attribute of successful business innovators is varied experience, which creates the coupling of a knowledge of means and of use in a single individual's mind. It is the generalist, not the specialist, who creates an idea that differs from the firm's current business line. Specialists are inventors; generalists are innovators. These people can be selected or developed. One ceramics engineering firm selects the best and the brightest graduates from the ceramics engineering schools and places them in central engineering to learn the firm's overall system. They are then assigned to field engineering where they spend three to five years with customers and their problems and then they return to central engineering product design. Only then do they design products for those customers. This type of internal coupling can be created by role rotation. Some aerospace firms rotate engineers through manufacturing liaison.

People who have the characteristics that make them successful innovators can be retained, however, only if there are reservations for them and sponsors to guide them.

#### *Attributes of Sponsors and Reservation Managers*

The innovating organization must also attract, develop, train, and retain people to

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*"[T]he idea generator [does] not take very well to being supervised. Idea generators and champions have a great deal of ownership in their ideas. They gain their satisfaction from having 'done it their way.' "*

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manage the idea development process. Because certain types of people and management skills are better suited to managing ideas than others, likely prospects for such positions should have a management style that enables them to handle idea people, as well as early experience in innovating, the capability to generate ideas of their own, the skills to put deals together, and generalist business skills.

One of the key skills necessary for operating an innovating organization is the skill to manage and supervise the kind of person who is likely to be an idea generator and champion—that is, people who, among other characteristics, do not take very well to being supervised. Idea generators and champions have a great deal of ownership in their ideas. They gain their satisfaction by having “done it their way.” The intrinsic satisfaction comes from the ownership and autonomy. However, idea people also need help, advice, and sounding boards. The successful sponsor learns how to manage these people in the same way that a producer or publisher learns to handle the egos of their stars and writers. This style was best described by a successful sponsor:

It's a lot like teaching your kids to ride a bike. You're there. You walk along behind. If the kid takes off, he or she never knows that they could have been helped. If they stagger a little, you lend a helping hand, undetected preferably. If they fall, you catch them. If they do something stupid, you take the bike away until they're ready.

This style is quite different from the hands-on, directive style of managers in an operating organization. Of course, the best way to learn this style is to have been managed by it and seen it practiced in an innovating organization. Therefore, experience in an innovating organization is essential.

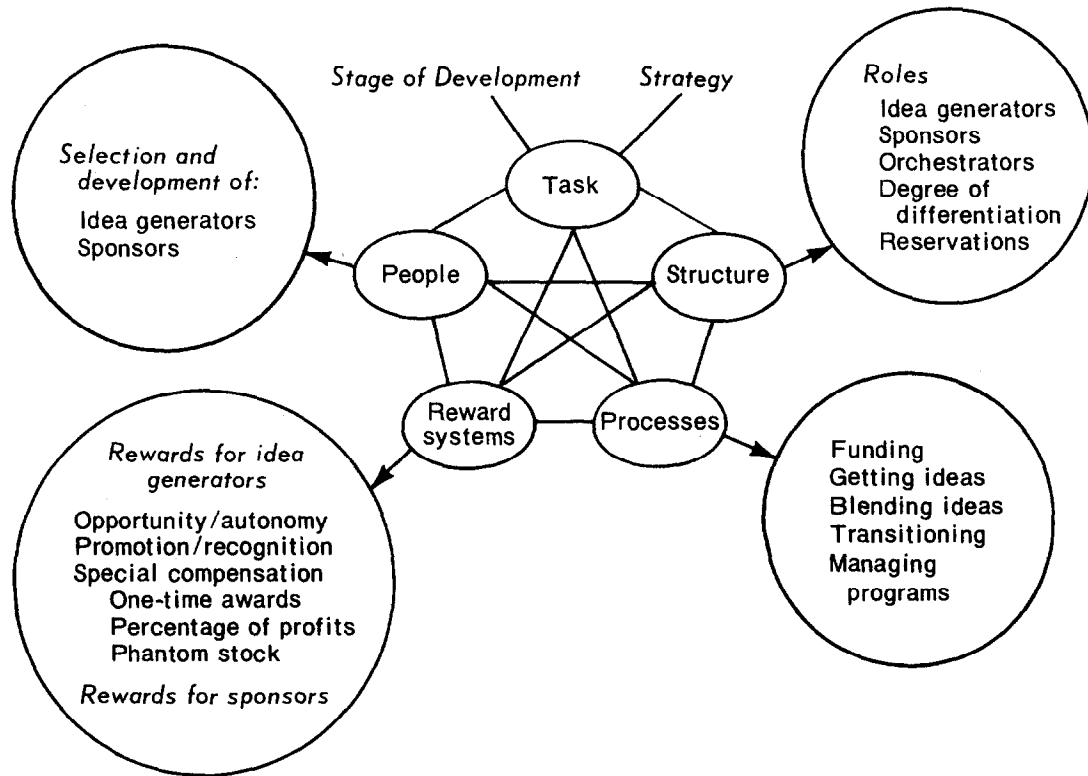
More than the idea generators, the sponsors need to understand the logic of innovation and to have experienced the man-

agement of innovation. Its managers need to have an intuitive feel for the task and its nuances. Managers whose only experience is in operations will not have developed the managerial style, understanding, and intuitive feel that is necessary to manage innovations because the logic of operations is counterintuitive in comparison with the logic of innovations. This means that some idea generators and champions who have experienced innovation should become managers as well as individual contributors. For example, the president in our case history was the inventor of the first-generation product and therefore understood the long, agonizing process of developing a business idea. It is also rare to find an R&D manager who hasn't come through the R&D ranks.

The best idea sponsors and idea reservation managers, therefore, are people who have experienced innovation early in their careers and are comfortable with it. They will have been exposed to risk, uncertainty, parallel experiments, repeated failures that led to learning, coupling rather than assembly-line thinking, long time frames, and personal control systems based on people and ideas, not numbers and budget variances. Sponsors and reservation managers can be developed or recruited from the outside.

Sponsors and reservation managers need to be idea generators themselves. Ideas tend to come from two sources. The first is at low levels of the organization where the problem gap is experienced. The idea generator who offers a solution is the one who experienced the problem and goes to a sponsor for testing and development. One problem with these ideas is that they may offer only partial solutions because they come from specialists whose views can be parochial and local. But sponsors are at the crossroads of many ideas. They may get a broader vision of the emerging situation as a result. These

Figure 7  
AN INNOVATING ORGANIZATION'S DESIGN COMPONENTS



idea sponsors can themselves generate an idea that is suitable for the organization's business, or they can blend several partial ideas into a business-adaptable idea. Sponsors and reservation managers who are at the crossroads of idea flow are an important secondary source of new ideas. Therefore, they should be selected and trained for their ability to generate new ideas.

Another skill that sponsors and especially reservation managers need is the ability to make deals and broker ideas. Once an idea has emerged, a reservation manager may have to argue for the release of key people, space, resources, charters, for produc-

tion time, or a customer contact. These deals all require someone who is adept at persuasion. In that sense, handling them is no different than project or product management roles. People do vary in their ability to make deals and to bargain and those who are particularly adept should be selected for these roles. However, those who have other idea management skills may well be able to be trained in negotiating and bargaining.

And, finally, sponsors and reservation managers should be generalists with general business skills. Again, the ability to recognize a business idea and to shape partial ideas into business ideas are needed.

Sponsors and reservation managers must coach idea generators in specialties in which the idea generator is not schooled. Most successful research managers are those with business skills who can see the business significance in the good ideas that come from scientists.

In summary, the sponsors and reservation managers who manage the idea-development process must be recruited, selected, and developed. The skills that these people need relate to their style, experience, idea-generating ability, deal-making ability, and generalist business acumen. People with these skills can either be selected or developed.

Thus some of the attributes of successful idea generators and idea sponsors can be identified. In creating the innovating organization, people with these attributes can be recruited, selected, and/or developed. In so doing, the organization improves its odds at generating and developing new business ideas.

## SUMMARY

The innovating organization described is one that recognizes and formalizes the roles, processes, rewards, and people practices that naturally lead to innovations. The point we have emphasized throughout this article is that the organization that purposely designs these roles and processes is more likely to generate innovations than is an organization that doesn't plan for this function. Such a purposely designed organization is needed to overcome the obstacles to innovation. Because innovation is destructive to many established groups, it will be resisted. Innovation is contrary to operations and will be ignored. These and other obstacles are more likely to be overcome if the organization is designed specifically to innovate.

Managers have tried to overcome these obstacles by creating venture groups,

by hiring some entrepreneurs, by creating "breakthrough funds," or by offering special incentives. These are good policies but by themselves will not accomplish the goal. Figure 1 conveyed the message that a consistent set of policies concerning structure, process, rewards, and people are needed. The innovating organization is illustrated in Figure 7. It is the combination of idea people, reservations in which they can operate, sponsors to supervise them, funding for their ideas, and rewards for their success that increase the odds in favor of innovation. Simply implementing one or two of these practices will result in failure and will only give people the impression that such practices do not work. A consistent combination of such practices will create an innovating organization that will work.



## SELECTED BIBLIOGRAPHY

The basic ideas of organization design and of blending structure, processes, rewards, and people practices are described in my earlier book, *Organization Design* (Addison-Wesley, 1978). The idea of differentiation comes from Paul Lawrence and Jay Lorsch's *Organization and Environment* (Harvard Business School, 1967). One can also find there the basic ideas of contingency theory.

The structure of the innovative organization and the three roles involved are similar to those identified in the investment idea and capital budgeting process. These have been identified by Joseph Bower in *The Resource Allocation Process* (Division of Research at Harvard University, 1968).

Innovation itself has been treated in various ways by many people. Some good ideas about technological innovation can be found in Lowell Steele's *Innovation in Big Business* (Elsevier, 1975).