Chapter 5.   Startup: The Care and Feeding of Infant Systems

Introduction

It can be exciting to revisit pieces I wrote years ago, and see in them deeper meanings than were apparent at the time. I did the work on which this paper is based in the late sixties and early seventies, and its conclusions and recommendations are taken from reports and client conferences of that era. I did not write the article republished here until 1980, chiefly because I changed the focus of my work and became heavily involved in management education. In "Startup: The Care and Feeding of Infant Systems," I can now read both a prophecy and a critique of present day organizations where rapid changes in markets, technology and business conditions have created what Peter Vail has called "permanent white water" (Vail, 1989).

In the fourteen years since I wrote the piece many organizations have come to be in a constant state of startup. The article now presents itself to me as a set of prescriptions for organizing, managing, and maintaining (healing) any organization which is undergoing a process of rapid change in its business or technology. My proposals for the design of startup organizations were fairly radical when I first made them. Now the structures, systems and team based management that I proposed are, if not universal, at least not uncommon among leading technologically oriented organizations.

For me, the paradox is that as many organizations have become more like startups, we have not yet very widely adopted the suggestions I make here for planning and managing the processes of change that are endemic to such

organizations. The arts of preparation, planning, reflection and learning that I advocate here to cope with the stress, fast pace and confusion of startup are largely ignored. In this paper I point to "task uncertainty" as a key variable in organization design. I propose one way of designing an organization to function well in conditions of high task uncertainty, such as startups. I examine intergroup conflicts and individual stresses that come up when such designs are used. They are as relevant to managing rapidly changing organizations as they were to managing startups. They apply to mergers and acquisitions, designing and developing new products, bringing them on stream, reorganizing or turning around a business, and redesigning or "re engineering" work processes. Yet with some shining exceptions, it seems to me that most organizations, even those greatly admired, still tend to muddle through these processes. It is as though excitement, chaos, challenge, and catch-as-catch-can management have some intrinsic addictive appeal that is very hard to let go, even when there are promising ways to do so.

In the startups I facilitated, there were constant conflicts between planners and doers. The latter tended to ignore or sabotage the efforts of the former. Yet they acknowledged that "overkill" in contingency planning and preparation was beneficial to the startup. In my more recent work in the personal computer industry, I have found that same reluctance to take planning seriously.

I have read widely in the literature of two World Wars, and have talked with people on both sides about their experiences on active service and in the underground. For many of them, it was a time when they felt more alive and more

committed than at any time since. It was also a time of disorder, uncertainty, and constant change. It was truly "their finest hour," to which every work experience since is compared, and usually found wanting. For people who enjoy newness, challenge and change, the startup of a new operation is the "moral equivalent of war." It is an opportunity to participate in what I have called the *Achievement* culture (see "Organization Culture and Quality of Service" in this volume). In such cultures, the goal is clear, the stakes are high, the need for each one's contribution is urgent, and there is a sense of cameraderie, even love, between "comrades in arms." Under the internalized pressure to achieve a desired result, awkward and perplexing questions about the ultimate desirability or goodness of the activity can be put aside. Reflection is an impossible luxury, or it seems to be, and when one is deeply involved in action, inner conflicts can be forgotten for a time. Perhaps there is something in us that loves chaos for its own sake, or for the sake of the relief it gives from other pains.

When I was involved in the most successful of the startups in which I participated, I pressed for planning out of mental conviction alone. My mind was made up, and it directed my will, but my heart was never in it. Detailed planning has never been my way of approaching life or work. I have always seen myself as a "startup kind of guy," loving to begin things, enjoying intuitive problem solving and decision making, but seldom staying around for the completion of the work.

Perhaps it is we who collude with the world "out there" to defeat our minds' attempts to bring order into our working lives. If that is so, then we shall do well to turn inwards to know and embrace the wild man and woman within. Surely

creativity, intuition and spontaneity are not inevitably enemies of order and rationality, but may be brought into relationship, perhaps through working with their cyclical alternation. However, that is for another time.

Not only are rationality and creativity at odds in the startups I studied, and in present day high technology organizations, but the mind and the heart are in opposition as well. People in startup organizations are frequently in denial about the consequences of willing self exploitation that is characteristic of such systems, and the same is true in many present days organizations engaged in constant change and innovation. I remain convinced that everything I said about the need to manage pressure and legislate rest and renewal in the startup is even more urgent today. While the startups of which I write in this article came to an end eventually, the stress and pressure of change in present day organizations do not. Not knowing what to do abut it, most leaders and managers endeavor to ignore, minimize, or rationalize it away. We urgently need to find ways to harmonize the mind and the heart so that the one need not oppress the other. I made some proposals in this article, but now they seem a bit inadequate and superficial for the magnitude of the task. The changes longed for in the inmost hearts of organization members are systemic and societal, and they will have to be rooted in a new appreciation of our own values and priorities as a species living a tenuous life on a fragile Planet.

To put the paper in context, at the time I undertook my initial work with new plant startup (1968) most organization development work was conducted in traditional hierarchical organizations. An implicit goal of the consultants was usually to shake up

and loosen rigid bureaucratic structures and authority relationships, often by making it safe for people to speak their truth about what was really going on. Team development and process consultation (Schein, 1969) were the usual interventions of choice, and there was still a strong underlying assumption in team development sessions that what was really important was to "get down to feelings" and for team members to give and receive personal feedback to one another. In fact, my involvement in the initial startup project began with such a team development session, conducted by myself and Jeffrey Atlas for a group of US engineers, who were soon to go overseas to provide technical consultation to the local management of a new chemical plant.

It was an unusually successful session, and following it we were able to interest the team leader in the possibility of our facilitating the development of effective working relationships between his Startup Team and the local management of the new facility. Eventually, Jeff and I went overseas ourselves with a contract to help plan the development of the "human system" of the startup, to facilitate working relationships during the startup period, and to research the process of bringing the plant on line, with a view to improving future startups. We arrived later than we had hoped, and our goal of helping to plan the system was submerged in the heat and pressure of what turned out to be a kind of war between the men and the machinery.

We had a tremendous learning experience about the limitations of our own technologies when, from the start, people saw our attempts to apply process consultation as "part of the problem" rather than as "part of the solution." We were

attempting to apply a reflective process to situations which our clients believed cried out for immediate and continuous action. Our clients were impatient with the time we asked them to spend in meetings, and they were looking for quick solutions to the problems that were right in front of their faces. We were young and adaptable and inventive enough to find ways to be helpful when we understood what was wanted. We spent some of our time helping to facilitate problem solving and coordination meetings, and coaching team leaders in meeting management. We mediated interpersonal difficulties and role conflicts between members of the outside startup team and local management. We adopted a form of CBWA (Consulting by Walking Around) in which we endeavored to spot difficulties in coordination, communication and relationship in their early stages, and bring help to bear. And we did our research. Each of the four members of the startup team kept a daily log of important happenings and observations, and at the conclusion of the seven months we spent on the project, I sifted through these materials for clues to what had happened and why. The output was an analysis of the strengths and (mostly) weaknesses of the startup process as we had observed and participated in it, along with specific suggestions for planning and managing future startups.

Much to my chagrin, my report was ignored at the time, and did not surface in any useful way for about fifteen years. Perhaps it was not written tactfully enough, but I suspect the major reason was that the startup was not considered particularly successful, and the people involved just wanted to move on.

On leaving the project I moved to England, where I practiced as an independent consultant for about eight years. I was sure I had acquired valuable knowledge that could provide a competitive advantage to any company willing to use it, and it was not long before I had another client where I could test my ideas.

My new clients were eager to improve their startup planning and operations, because they had been plagued with several difficult startups in the recent past. They were willing to invest in following my recommendations about bringing people on well in advance of the startup for training and planning, and carefully working out the interfaces and role relationships between the various groups involved in constructing, commissioning, and operating the new plant. We went through seemingly endless meetings to plan the startup and work through misunderstandings between the different teams as they developed. We did role negotiation to make sure everyone knew what they were supposed to do and everything was covered. We did contingency planning to prepare in advance for things that might go wrong. We trained everyone in a variant of the Kepner Tregoe approach to problem solving. We constructed an elaborate, state-of-the-art planning process to make sure everything on the "critical path" was done when it needed to be.

I guess our planning paid off, because within four days of "lighting up" the plant was at 104% of capacity, and it stayed that way. As I point out in the article, economically, our "overkill" on planning and training had more than paid for itself, and everyone involved got credit for a job well done. In my experiences in startup,

rationality and preparation have been the keys to high performance, even though they have not been much fun for me or for my clients.

Startup: The Care and Feeding of Infant Systems

As an applied behavioral scientist I have enjoyed helping plan and execute large-scale plant startups. The experience is invariably exciting and poses a variety of problems of organization and management that differ from those of the "steady-state organization" in the same way that military leadership in the field differs from the management of a peacetime force. To me, the startup organization offers a kind of stress-testing laboratory for organizational structures and management practices. The startup organization grows quickly. In it we can observe the normal operating problems of organizations intensified many times, so that they move toward resolution or disaster at a much faster rate than ordinary.

From my observations of the startup of petrochemical installations I have drawn some generalizations for the planning and management of a system startup. The generalizations concern the following: (1) designing the system (organization structure), (2) breathing life into the system (staffing, training, planning, and team development), (3) managing and maintaining the system (management style, conflict resolution, and stress reduction), (4) helping the system (the role of the internal or external organization consultant in a startup), and (5) managing the system's boundaries.

Designing the System

In his excellent book on organization design, Jay Galbraith (Galbraith, 1978) provides a model that is useful in understanding innovative startup organizations. He centers his model on the concept of task uncertainty, the unpredictability of events. In the startup of complex man/machine systems, the one thing we can be sure of in advance is that there will be many more problems and unexpected difficulties than we would expect in the same system when it is operating normally.

Task uncertainty requires us to communicate, solve problems, and make decisions in organizations. If everything could be predicted in advance, we could bureaucratize the entire process, writing it all down in operating manuals, procedures, rules, and regulations. We would then need only to supervise operations to make sure that things were done as prescribed, and the system would manage itself. When we design productive systems, we try to minimize task uncertainty and provide decision-making rules and procedures. We also provide communication channels and problem-solving functions to take care of the degree of task uncertainty that we expect.

When we start up a complex system that has been designed to handle a normal amount of task uncertainty, we find that the provisions built into the organization for communication, problem solving, and decision making are inadequate to deal with the greatly increased uncertainty typical of the startup period. During startup, many things fail to go according to plan: Equipment does not operate properly; roles and responsibilities are unclear or disputed; tasks are not carried out as expected; human and material resources are not available when needed, or do not perform as expected;

and so on. In short, the provisions made in a normal, steady-state operation for communication, problem solving, and decision making are inadequate for startup operations; communication channels and management functions become overloaded and choked with data, problems, and requests for help, and the system does not perform very well. Anyone who has lived through a really difficult startup can supply the details.

We can deal with increased task uncertainty by providing additional resources, by reducing the need for information processing, or by redesigning the organization to increase its information-processing capacity. The first of these approaches appears to be by far the most common, chiefly because it can be done without any conscious decision or management action.

Providing Additional Resources

If we take no other action in response to the increased task uncertainty of a startup, we must provide additional resources. The most obvious of these are time, money, materials, and people. Since it takes longer to get things working properly under conditions of task uncertainty, we may try to reduce the time by providing material or human resources. When we see we aren't going to make the schedule, we bring in additional technical and managerial resources; we work people longer hours; and we make expensive modifications to the physical plant. If the capital investment in the system is low, and the marginal value of the product is modest, then the cost of extending the time allotted for the startup may be the easiest cost to bear. In the complex petrochemical systems, in which I gained my own startup experience, the

cost of a day's production was reckoned in five figures, so it was less costly to add people and to spend money in ways that would reduce the startup time. Some of the ways in which this is done are to:

Add human resources. Typically, startups are overstaffed; additional technical personnel are made available, and extra maintenance people may be kept on call as well. Sometimes a "startup team" of highly qualified people will take over from the normal operating staff during startup, handing the system back to the latter when it is operating properly.

Add material resources. Extra parts may be kept on hand, along with complete units of critical pieces of equipment.

Add money. Budgetary restrictions and controls may be relaxed; procurement procedures may be streamlined and simplified so that operating and technical personnel may quickly order and obtain critically needed materials.

Add time. If all else fails, the startup will simply take longer to complete. Schedules will not be met, and projected targets will recede into the future. Time is the resource of last resort, and the one that requires the least planning and creativity to make available.

Reducing the Need for Information Processing

Whenever we can reduce interdependency between the parts of an organization, we reduce the need for information processing. In a continuous process

operation this is difficult, but any time we can create a "holding" or buffer function between two interdependent parts, we can reduce the necessity for them to march precisely to the same drummer. Healthcare systems, human services, and academic institutions are classic examples of organizations designed to reduce the interdependence of their parts and to cut down on joint decision making. This form of organization often produces an inferior product. In the case of the three examples, the value of their products and services is difficult to assess, and the organization structure suits the needs of their professional members for autonomy.

In the startups in which I have participated, integrating the parts of the production process was a progressive function. During construction and early commissioning phases, the different parts of the plant were loosely linked by an overall schedule. As the different parts came closer to being "on stream," it became more and more important to build and maintain joint decision and problem solving links among them. If the changed requirements of a more interdependent system were not foreseen and consciously prepared for in advance, people often failed to make the shift when required, and the startup suffered accordingly.

Increasing Information Processing Capacity

My main point about organization design is this: If we are unwilling to pay the costs of task uncertainty in missed schedules and lost production, then we must recognize that the ideal organization for startup does not have the same structure as does the optimum steady-state organization. The startup organization calls for

additional problem solving or learning capacity. This can be provided by both vertical and lateral alterations in the organization.

When we create lateral or crossfunctional problem solving relationships in an organization, we reduce the load on vertical channels. Day-to-day operating problems can be dealt with closer to the source, leaving higher management free to perform coordination and support functions. In a multiplant petrochemical startup, for example, the temporary startup organization was based on startup groups, one for each plant. Each consisted of the production and maintenance supervisors for one of the plants, relevant technical advisors, and vendors' representative(s). Each such startup group was responsible for planning and tracking the startup within its plant, solving operating and technical problems, and reporting on progress through the production supervisor to a startup steering committee. The latter consisted of the top site management, the heads of the various functions and advisory groups, and all the second level production managers.

This modified matrix form of organization has a number of inherent advantages for rapid information processing during startup. It reduces information overload by shortening the linkage between the origin of a problem and the points at which a decision can be made and implemented. It thus reduces response time, permitting the organization to keep on top of a rapidly changing startup situation. Decisions are made in the field by those whose current experience and knowledge about the local situation are up to date and detailed. Therefore the relevance and appropriateness of

the organization's response is likely to be more appropriate and relevant than if the decision was being made at levels once or twice removed from the plant.

Other advantages are less obvious. When a modified matrix organization is operating well, it fosters cooperation, mutual influence, and cohesion between functions. People within the plant startup group are relatively free to work out their own roles and responsibilities to suit their differing styles and capacities, and they can develop a high degree of interdependence, teamwork, and team spirit. Because they feel jointly responsible for the success of the whole, they engage in less blaming and buck-passing than is typical of the normal, functionally organized operation. Each individual has more authority and responsibility than he or she would normally have, so the jobs are more satisfying and fulfilling to ambitious, achievement-oriented people.

These advantages are not merely theoretical; the modified matrix works extremely well in practice. Unfortunately, it can also work very badly. The difference between effective and ineffective applications lies not in design of the organization, but in how it is implemented and managed. In most organizations there are potent forces that can work against the success of a modified matrix. These forces must be taken into account and dealt with if any such innovative organization form is to realize its promise.

If a modified matrix is temporarily superimposed on a normal, functional organization, it is not at all unlikely that these two organizational forms will compete with each other. For one thing, rewards and discipline are meted out by the

traditional functional organization, so functional managers have considerable power over their subordinates. If they are not committed to the matrix way of working, they will interfere with it and subvert it—and they will often not be aware that is what they are doing.

In one startup, for example, the Engineering Manager kept pushing his people for progress on long-range planning projects. This conflicted with their day-to-day commitments to the plant startup group, but they did not confront him about this because they were new in the system and nervous about how he might react. As a result, they were always behind in work for their startup teams, and morale and cooperation within the plant startup groups suffered accordingly.

The functional organization offers its members relief from feelings of pressure and guilt. In the normal situation, a person can feel that he or she is doing all right so long as the boss is happy. In the matrix organization everyone from all functions is mutually responsible for the project's success. When the team's plant drops behind schedule, each team member feels pressure to perform better. In one startup for example, a technical advisor was asked for help by a vendor's representative in his area. There was nothing unreasonable about the request, but the advisor was hard pressed to cope with his workload. Instead of reevaluating his own priorities, he replied that the request would have to be routed through and approved by his functional manager. By the time this could be accomplished, the help would have been useless, so the vendor let it go. The advisor could be comfortable in feeling that he was "just doing his job," but the startup operation suffered.

The modified matrix requires that individuals be willing and able to exert a great deal of informal influence on their teammates across functional lines. Unless people accept this responsibility for influencing one another, the system works poorly.

Modified Matrix: a High Conflict Model

Trying to influence a peer to do his or her job better often results in stress and conflict, and many managers and engineers are not particularly skillful in motivating and persuading without formal authority. The normal functional organization buffers the participants from this sort of confrontation and when one's colleague fails to perform, it is comfortable to resort to blaming rather than exerting pressure for change. For example, a production supervisor constantly complained about the poor service he was getting from maintenance, but he would not confront the issue openly with the maintenance supervisor. To his functional way of thinking, it really wasn't up to him to get the maintenance people to do their jobs properly, and since he had many other things to worry about, it reduced stress on him to blame and complain rather than to accept responsibility for solving the problem.

Modified Matrix Styles and Staffing

In order to operate smoothly and effectively, the modified matrix organization requires a different staffing pattern and a different style of management than that of the normal functional organization. Most production organizations are organized in a fairly tight pyramid for close control of operations and maximum efficiency. At the organization's lower levels, the individual is neither expected nor encouraged to exercise initiative or to take on a great deal of responsibility. In the modified matrix

organization, problem solving and decision making are pushed downward in the organization, so the people involved must be qualified and motivated to take a more proactive stance toward problems. Those who are used to a highly directive and controlling style of management often find this transition hard to make, and some are temperamentally disinclined to make it. Often, too, good individual contributors have difficulty working as group members in the team settings that the matrix organization always requires.

Higher management in production organizations tends to use a more directive and controlling role than is appropriate to the modified matrix organization advocated here. The whole thrust of the matrix design is to free higher management to focus on overall coordination, to provide both tangible support in the form of needed human and material resources and psychological support when the going is rough, and to manage the boundaries between the startup system and its environment. If higher management continues to direct and control the day-to-day details of the startup, these functions will be poorly covered. Furthermore, the problem solving teams at lower levels of the organization will be demotivated and frustrated in the exercise of initiative and skill that the design was originally intended to release.

An example of this occurred when one plant startup group was behind schedule, and the Site Manager began attending the daily team meetings. Some of the team members who knew the day-to-day situation most intimately and should have been active participants in the discussions were intimidated by his presence, deferred to his authority, and hardly contributed when he was present. Their answers to

questions after the meetings made it clear that they had information and opinions that might have affected decisions made in the meeting, but they were reluctant to stick their necks out and be blamed later on if things went wrong. Later, when higher management was prevailed upon to stay away from these meetings, problem solving improved markedly.

The tenor of this discussion may give the impression that the modified matrix organization is full of defects, or that making it work is more trouble than it is worth. As noted, it can work both superlatively well and agonizingly badly. It works well when people understand and are well prepared for their roles, and when higher management adopts the broadly facilitative and supportive style the startup team needs in order to take initiative and personal responsibility. It works badly when higher management's commitment is lacking, and when people do not really know how to work in a modified matrix. Some of the things that can go wrong have been noted; later sections on building, managing, and maintaining the startup system will discuss how to make them go right.

The modified matrix organization is an example of creating lateral relationships that improve problem solving and information processing. Vertical planning and tracking arrangements may also be designed to give decision makers quicker and more complete access to what is going on in the startup system. Higher management can use these devices either to control the startup process directly or to aid problem solving in the modified matrix system.

Critical-path scheduling techniques may be used to plan startups. In one case the plan was constructed in great detail by a planning section under the direction of a manager with considerable startup experience. The continuously updated plan was displayed on a number of large boards so that any member of the startup organization could immediately see how his own work related to the whole, and what parts of the operation were in danger of falling behind and holding up overall progress. Planning staff met twice each day with the plant startup group. The morning meeting dealt with overnight progress and problems and produced a revised action plan for the day shift. During that shift the overall plan was updated by the planners. The overall plan was reviewed with the operating team in an afternoon meeting, and at that time targets were established for the following twenty four hours.

Management felt that this process gave a fine degree of control, but the favorable result was not achieved without difficulty, and the difficulty illustrates some of the difficulties in implementing even the best designed planning system: In the precommissioning and late construction phases of the project, the planners became immersed in the technical intricacies of the plan. The managers and engineers who were supposed to operate according to the plan tended to ignore it in favor of the ad hoc problem solving and decision making that suited their own strong bias for action. The plan became out of date because the operators were not very good about feeding information into it, and the Planning Manager became extremely frustrated over his inability to achieve his personal goal of managing the startup by means of the plan.

This difficulty with interactions was neither random nor caused by the personalities of the people involved. There is an inherent tension between doing and planning that is exacerbated under the heat and pressure of startup. The joy of battle that engineers and managers experience in their struggles to tame complex technical systems breeds distrust and disregard for the merely intellectual activities of the planner. Even if the interaction between doers and planners is carefully designed and managed, it will give trouble. If this inherent tension is ignored, then the best laid plans will certainly go awry.

In starting up complex technical or sociotechnical systems, it is also useful to create special information-processing systems for problem identification and problem solving. Instead of waiting for problems to arise and coping with them on an impromptu basis, a set of roles and procedures can be agreed upon in advance that will greatly expedite problem solving in the heat of battle.

The simplest way of doing this is to engage in detailed advance contingency planning. Designers, vendors, technical experts, and those who will operate the equipment should meticulously go over the flow chart of the system before startup. They should identify possible trouble spots and agree, on how these will be monitored, who will collect data on their functioning, and who will take what action if difficulties arise. This system of contingency agreements then serves as a supplement to the normal organization of the startup monitoring system functioning. Help is ready to be activated at the first sign of need and without a lot of discussion about who is responsible for what.

Such contingency planning can trigger considerable resistance, reasonable though it may look on paper. Designers don't like to assume that their elegant creations will fail or function badly. The same goes for contractors and equipment vendors. Operating people prefer to deal with problems as they come up, rather than "borrow trouble" in advance. Nearly everyone has some reason for colluding in the false hope that everything will come out all right. I have found myself in a startup organization being at the same time the least technical person and the staunchest advocate of technical contingency planning. The fact is that people often have to be pushed pretty hard to engage in such advance planning.

In one startup this initial resistance was turned into at least guarded enthusiasm after all those involved had gone through a form of problem solving training (a variation on the Kepner Tregoe approach) along with considerable work on problem solving in groups. The training heightened awareness and sensitivity to technical problem solving and gave everyone involved a common language and methodology with which to work. A system was designed that emphasized rapid spotting, evaluation, and assignment of technical problems through the medium of a central problem register managed by the engineers who had designed the plant.

It was also recognized that the problem solving process itself could lead to difficulties if design changes and modifications to the plant were not carefully controlled. It is easy to upset the operation of a complex system by tinkering with one part of it. The problem solving system that eventually evolved included stringent evaluation of all proposed modifications to the plant by designers, construction

people, and operating management, and a procedure whereby accurate information on all design changes was used to update the line diagrams of the plant.

Plan from an Information Processing Point of View

These rather homely examples illustrate that in talking about "organization design," we are not necessarily involved in some grand restructuring of the organization. What is important is that we adapt and plan from an information processing point of view when we deal with startup. We know in advance that startup problems and contingencies will overload the normal communication and decision-making capacities of the organization and its members. We can predict from experience and reason what kinds of trouble we are likely to run into. Designing the startup organization from the information-processing point of view means asking ourselves some simple questions:

· What sorts of problems, communications, and decisions are we likely to encounter during startup that are different from or more pressing than those encountered during normal operation of this system?

· In the normal organization, where does the information about these problems originate, and where does it have to be passed for decision and action?

· Can we shorten the communication pathways, reduce the number of levels involved, or bring the problem owners together with the problem solvers in such a way as to facilitate the speed and effectiveness of the startup?

· What procedures and systems can we invent to accomplish our information

processing tasks?

· What roles, responsibilities, and authorities must be assigned and accepted so

that these procedures and systems will work?

· What kinds of training, briefing, team building, or intergroup negotiation must

take place so that people will know and be motivated to perform their roles

and responsibilities and make the system work?

Taken together, all of these questions except the last constitute the organization

design task. With a bit of consultation, most startup teams can do this work

themselves. Designing an organization for startup does not require special knowledge

and expertise beyond that possessed by managers experienced in startup. Rather, it is

a matter of being willing to take the time and make the effort to think through the

design of the organization, putting aside the model of the normal "steady state"

organization as an ideal, and asking ourselves, "What is the ideal organization for this,

our unique startup situation?"

The answer to the last of the questions, however, is the one that transforms the

startup organization from plan into reality, and we shall deal with it in depth in the

next section.

Breathing Life into the System

The most cleverly and carefully designed startup organization is not worth the

paper it is drawn upon, nor can it properly be said to exist, unless it is in the minds and

hearts of the organization's members. "Breathing life into the system" is making the

plan live through the attitudes, knowledge, and actions of people. This principle is more often than not ignored by those responsible for managing startups.

All of us know, from having worked for years in organizations, that they work well only when people know their roles, responsibilities, powers, and the ways in which their tasks fit with those who interact with them. And, at least intuitively, we know that if people are not proud of their organization and if they do not believe in its purposes and ways of working, they will lack the energy needed to fuel a high performing system. Building an organization is simply making sure that people will know their part in it, and making sure that their hearts will be in their work.

The problem is that when we come to modify a work system or construct one from scratch, we usually overlook the organization building that has been required to give life to the organizations of which we are members. We underestimate the time and energy required to build an organization, partly because so much of the process is informal, implicit, and not under the control of management. To illustrate this, think back to some organizations you've joined as a new member, or some transfers you've made to a different part of your organization. Remember what your boss told you about what was expected of you and how to get along.

Now, remember how you *really* learned how to get on. You probably learned most from the peers and subordinates who gave you the word, either tactfully or frankly; from your own observations of how people did things and how they dealt with one another; and from the awkward trial-and error process of learning how to

get things done and how to get what you wanted. Remember how you learned which rules were meant to be observed, and which you could safely ignore.

There was probably a period of time at the start during which you weren't very effective; you may have felt you weren't really earning the money you were being paid, and you felt a little guilty about it. All in all, however, it probably went fairly smoothly. After all, everyone else knew the ropes. You had only to keep your eyes and ears open and learn from observation and experience in order to play your part. After a while, you probably even learned to value and defend some of the old ways of doing things that you'd thought were weird, inefficient, or downright stupid when you first arrived.

When you staff a startup system from the ground up, everyone is like you were when you first joined the organization or transferred to a new part of it—even the boss. That is, even the head of the startup organization does not know exactly how to use his or her authority to get things done and how to weld this collection of individuals into an organic and smoothly functioning whole. Everyone has expectations of everyone else, but each person's expectations are at least partly based on prior experiences that are not shared with the others. So everyone is continually being brought up short by the failure of the others to play their parts—to read their lines right. Roles and responsibilities are fuzzy and ill defined. Because people don't know exactly what the limits are, there is continual testing and jockeying for power and influence. A lot of energy gets drained away from the work into the confusion and competition over what the organization is and how it is to be operated.

These sorts of problems are impersonal in their root causes: People inevitably engage in a learning process when an organization is in the process of formation. It would not matter a great deal who the people were. The process would still be intense and difficult. Unfortunately for those who are in the situation, it is difficult to see it this way. Their experience is of other individuals who are uncooperative, competitive, uncomprehending, and dense. They take it all very personally indeed. Consequently, relationships fail to get off to a good start, and this can create a legacy of mistrust and bad feelings that gives trouble for a long time after the original causes have been forgotten.

When an organization is not completely new, and the startup puts people who already know one another into new roles and relationships, the situation is not so difficult. Much of the basic knowledge and behavior norms that the individuals bring with them are still appropriate and useful. However, as the participants' roles change to meet the demands of a new technical system, their behavior must and will change as well, and this transition also calls for much learning about who is supposed to do what to whom. Some of this can be laid out in organization charts, but a surprising amount cannot be. It must be worked out by the participants themselves as they strive to build an organization that can cope with the increased stress, task uncertainty, and turbulence of the startup.

For some reason, those who manage startups often give little attention to programming the startup of the human system. They design the technical system to the *nth* degree, sometimes simulating its operation with computer models. They

provide for exhaustive quality checks on the construction, and for cleaning and testing each of the parts before they are brought "on stream" to function together as a system. In contrast to the care and attention to detail that is given to complex technical equipment, the people who will make this system work or allow it to fail are given a quick briefing on the organization, trained in the technical parts of their work if they are not already qualified, and plugged into the system. If the system then doesn't work very well, the tendency is to blame the people who do not seem to be doing their jobs properly. The job itself, including its interfaces with other jobs, is much less often looked at as the root cause for poor system performance. This is so in spite of the fact that usually the best and brightest individuals in the organization are given key startup roles; startups are seldom staffed with "dead wood."

In my experience, the most serious causes of poor startup performance are poor fit between adjacent roles (jobs that require their incumbents to work closely together) and a lack of shared understanding between the incumbents on how they are going to manage the interface between their jobs. These problems are what bringing an organization to life is about. Once the overall design has been set up, its parts (roles) have to be carefully shaped to fit together without too much overlap or too many gaps, and the members have to learn how to operate those parts for which they are responsible (their jobs) in a way that harmonizes with the whole.

Building an effective startup organization is a bit like putting on a modern dance performance. First an overall structure is designed, and the movements that each dancer will make are specified and integrated with the movements of others (the

choreography). Then the dancers have to be rehearsed in their parts. Even though each dancer may be well qualified for his or her part, each will be stronger in some aspects and weaker in others. As rehearsals progress, opportunities will occur to strengthen the entire piece by redesigning the parts to make better use of the talents of individual dancers, and the dancers themselves will learn how to coordinate their movements and how to compensate for one's weaknesses with another's strengths.

If the dancers have been well rehearsed, the first performance (startup) will be a good one, but it will not be flawless. The dancers will respond in differing ways to the stress of opening night, and their operating characteristics will change somewhat from what they were during rehearsal. Further mutual adjustments will be required under this new load of performance before a live audience before the company's artistry reaches its ultimate peak.

This analogy may seem fanciful to the reader, but to one who views an organization as an intricate pattern of continually moving human relationships, it is appropriate in all but one respect. The director of a dance company would not consider performing without rehearsal, but managers of startups frequently do call upon their performers to play their parts with only the most cursory briefing. And it is the star performers, the key managers and technical people, who are given the least rehearsal of all. At least the operators are generally given fairly thorough job training.

The reason usually given for bringing people into a startup with little lead time is that good people are expensive and their resources are needed elsewhere in the organization until the startup begins. I am not convinced that this is really the reason

involved. People who design and build complex plants are pretty intelligent when it comes to figuring out cost/benefit ratios, and a few minutes with a calculator could convince anyone that where capital cost and product value are high, the cost of bringing people in early to save just a few days in startup time is small by comparison. I believe, rather, that managers are unaware or unconvinced that startup time and costs can be substantially reduced by bringing people in early and rehearsing them in their startup roles. When people do arrive early, their work is not ready for them, and though we can simulate the behavior of technical systems on a computer, no one has yet produced a program that simulates all the technical, logistical, and human problems in managing a startup. People who arrive early for a startup often complain that they have too little to do and a lack of direction and structure.

Doing It Well: A Case in Point

I shall present an alternative to this state of affairs, based on a very successful startup I helped plan for a British chemical company. Organization building by bringing people in early was judged by local management to be a major key to the success of this project. Here's what the Commissioning Manager, J.B. Horsley (Horsley, 1973) said about the project:

> There was a clear notion that the people and the organization were just as important as the technology…. The equality of people and technology was expressed via the People Plan,…a controlled way of bringing people on to the project in advance of the tasks they were required to do…. The Plan appeared as a huge bar chart which indicated the dates people would arrive and the things

they would be doing prior to their "real" tasks—the aim was to create situations in advance and train people so that the startup would not create any surprises.

In addition to the job training and technical planning that the management and technical staff engaged in to prepare for the startup, all exempt staff engaged in organization building. A key aspect of this process was an activity called "role negotiation." This began with a plan for the organization drawn up by the project manager. Each person in the team then made a detailed specification of his tasks and of the work relationships with others that were required to achieve good performance on his own job. These role and relationship specifications were exchanged and reviewed for overlap and gaps between roles, and for disagreements about who was responsible for what.

In a series of team meetings, the people then negotiated modifications in their tasks, responsibilities, and authority until all were satisfied that they had a system that would work under the demands of the startup. The results of the negotiations were written down in the form of "contracts" specifying the reciprocal duties and responsibilities that people agreed to carry out during different phases of the startup process. If a person's role was to change from one part of the startup to another, that change was negotiated and detailed in writing in advance. If the "ownership" or responsibility for a piece of equipment or task was to change, this too was determined beforehand. If it appeared that workloads would be especially high for a person or group during

one phase of the startup, an arrangement for sharing that workload was negotiated.

The use of role negotiation permitted an orderly development that elicited this further comment from Horsley (Horsley, 1973):

> The whole organization evolved because it just seemed to fit the people, the tasks, and the problems. Because the organization was developed from within, there was a high degree of commitment to it. Even if it wasn't perfect, people had a will to make it work.

> People were committed because they themselves had built the organization and because it fitted them. During role negotiation, questions of personal preference and of individual suitability fur particular tasks and responsibilities were openly (though uncomfortably) discussed and provided for. These considerations took precedence over what was considered "normal" in the organization. People took pride in the unique structure and way of operating they had developed, and when arrangements failed to work as expected, they worked to adjust the system instead of blaming a mythical "them" for their problems.

> In my experience, such an "organic" approach to organization building is effective in producing a cohesive and determined team whose members know what is expected of them and who work together unusually well. It is important, however, to be clear about the costs and demands that must be met to achieve a positive result. The most important of these is the provision by higher management of lead time—that

is, bringing people into the organization far enough in advance that the organization building process can be accomplished before the startup begins.

This is only partly a question of the amount of time it takes to define roles and to go through the mechanical process of negotiating them. The role negotiation process is moderately demanding on the individuals involved. It requires people to confront one another openly about both task issues and personal preferences. I takes time to develop the trust and confidence to do this, and doing it may be somewhat stressful. It is a process that cannot be effectively accomplished when the startup is imminent or under way. When the participants are already under high pressure and stress, they will find the personal demands of role negotiation threatening and stressful, and they will reject the process or only participate at a superficial level. In such circumstances, the likelihood is that differences and conflicts will be only partially worked through, and some working relationships will be strained rather than strengthened.

Success also depends on higher management's understanding the constraints it is placing on its own prerogatives by delegating some aspects of organization building and detailed organization design. There is nothing more demotivating and discouraging to participants in this demanding and difficult work than to be told that the decisions they and their teammates have made have been changed by the hierarchy.

Finally, although team-building processes like role negotiation are not technically complex, it is useful to have someone with experience help the people

who are carrying it out. When people first engage in these processes, they tend to feel a little timid and uncertain; the support of someone who knows it works and knows how to make it work is comforting and saves time.

In summary, the process of organization building fleshes out the bony skeleton of an organization chart with detailed roles and with formal and informal understandings among members as to how they are to work together. It brings the organization to life. Without attention to this process, the major startup problems will often turn out to be human and managerial, rather than technical. The use of some team-building process such as role negotiation can provide experience in working together in advance of the startup. This gives key personnel a rehearsal in working together under moderate pressure.   They learn one another's "operating characteristics," establish mutual expectations, and find their places in the social network and pecking order of the new organization. When the startup begins they have built their own organization, and they are committed to make it work. They have also established and practiced ways of changing the organization when the need arises.

I regard the organization building process as a key to startup success. For it to proceed effectively, key participants must have enough lead time on the project to engage in team-building activities. It is really impossible to plan the organization once the startup is under way. The best that can be done is muddle through. Unfortunately, because breathing life into the new organization is an organic process rather than a

tangible task, it is usually overlooked and under resourced by "pragmatic" engineers and managers.

<div align="center">**Managing and Maintaining the System**</div>

The traditional, steady state production organization is characterized by the drive for efficiency—that is, producing the greatest economic output from the least input. To achieve this ideal, procedures are specified in detail. Operations are closely controlled and monitored; deviations are quickly detected and corrected. Such organizations tend to be hierarchical, pyramidal, and managed from the top.

The task uncertainty and change faced by the startup organization dictates that it be managed for learning and adaptation, not solely for efficiency. As pointed out above, this ideal learning organization is flatter, with more lateral communication and more overlap between roles. Practice is guided more by overall principles and the communication of experience, and less by specific rules and procedures. To avoid overload at the top, problem solving is pushed down in the organization, and higher management is therefore less closely in touch with day-to-day details of the operation.

As the focus of the organization shifts from efficiency to learning, the appropriate management style moves from directive toward facilitative management.

Facilitative management styles differ from directive management not in being softer or less ultimately demanding of results, but in the ways in which high performance is fostered. Facilitative management focuses on providing the conditions under which people will be motivated and enabled to perform well. Instead of

managing the startup from the top, higher management's energy is devoted to selecting and developing people, inspiring them to their best efforts, planning the organization and the startup process, assuring the flow of needed resources into the startup, managing boundaries with the parent organization, and monitoring performance against targets.

At levels below the top, a directive, "take charge" management style may still be most appropriate during the action phases of the startup; the managers who do well in operating roles in a startup are often dynamic, powerful people who enjoy the excitement, drama, and the personal responsibility of operating under emergency conditions. When such an operating style is applied from the top, however, it can cause trouble.

One difficult startup was made more difficult by the needs of the Site Manager to take personal control when things went wrong. Because the system was too complicated and fast-moving for him both to stay abreast of daily events and also to perform his overall coordination job, he succeeded well at neither. The active presence of his dynamic personality and authority in the control room and in team meetings paralyzed those who had current information and expertise, and the coordination, resourcing, and boundary management functions suffered from his neglect.

By contrast, a very successful job of startup management was done by another manager who might well have been overlooked for this role because of his thoughtful, introspective, and somewhat slow moving style. This manager consulted all

interested parties before making difficult decisions. He insisted on detailed planning of the organization and of the startup procedures. He spent what his subordinates thought was an inordinate amount of time in group meetings, making sure everyone was informed and committed, and working to resolve or smooth out disagreements and conflicts between key actors. He was so receptive and attentive to advice as almost to appear insecure. His subordinates were busy with the many details of the startup, but he always seemed to have time to talk with people.

This manager facilitated the operation instead of directing it. That does not mean he was weak or soft. When conflicts surfaced, he faced them head on and got the parties together to resolve the issues. When a key subordinate failed to produce, he replaced him. But he clearly saw his role as creating the conditions for others to get on with the job, rather than doing it himself. Thus he was able to create an effective team.

If this facilitative style is to be effective, it needs time to become the accepted norm within the startup organization. Most of the staff will probably come from production organizations that are directed and controlled from the top, and they will tend to maintain their normal habits of looking to the top for solutions and restricting communication and cooperation with their peers. But when managed closely from the top, the modified matrix will not produce the benefits claimed for it. It is vital that if such a structure is chosen, top management must be willing and able to learn to use a more facilitative style than they normally do. Otherwise, it is probably better to try to

muddle through with a more traditional organization structure that is managed in the way most people know and expect.

An important aspect of management style in any organization is how conflicts are managed and settled. It acquires great importance in the startup organization because the nature of the work creates conflict. The normal steady state organization has an answer for most operating problems that come up, so usually the only task conflicts that arise are those that concern proposed changes. The startup organization, operating under much greater task uncertainty, calls for first-time solutions of a correspondingly greater number of problems. The more new problems there are to be solved, the more opportunities there are for disagreement and conflict. As Horsley (Horsley, 1973) put it:

> The ideal organization for a project ... produces a fairly high degree of conflict over work issues. People therefore need some understanding of the nature of task conflict and personal conflict plus skills in handling each so that they might tolerate moderate amounts of conflict.

In traditional organizations, a good deal of task conflict is handled by *forcing* or by *smoothing*. *Forcing* occurs when a difference of opinion is handled by someone's using organizational authority or personal power to require others to go along with his or her decision whether they agree or not. *Smoothing,* or covering up conflict occurs when people act as though they have no difference of opinion; they avoid actions and discussions that are certain to bring their differences into the open.

Forcing works all right when the person with the power has the best answer, or when the quality of the decision is less important than getting everyone lined up and headed in the same direction. But it should be used in moderation; otherwise, people become resentful and begin to hang back, or they sabotage decisions they disagree with.

Similarly, smoothing is an acceptable way to reduce personal wear and tear when the matter at issue doesn't affect the quality of system operation much, or when there is a lot of time available to work things out in indirect, roundabout ways.

However, if people are trying to come up with really good problem solutions, and if several people hold important pieces of the puzzle, then some method of conflict resolution that is both more direct and more participative than smoothing or forcing must be used. People need to learn to confront conflict: They must learn to be open about their ideas and objectives, listen to each other's ideas and talk them over, and agree to some action on the basis of a reasonable weighing up of the alternatives.

Unfortunately, in the pressure cooker of a difficult startup, many people are found wanting in the listening and reasonable weighing-up parts of this equation. They become passionately committed to their own ideas, and the high stress involved narrows their vision. It becomes difficult for them to expand their thinking to take in unfamiliar alternatives. Conflicts that began as mere differences of opinion become bitter and personal as individuals react to one another's apparent stubbornness and unwillingness to listen. After a while, relationships deteriorate and everyone seems to become irritable and touchy. When those involved cannot find ways to solve their

problems together, they either withdraw into smoothing, or they resort to forcing those issues on which they can muster enough clout to get their way. Either way, problem solving suffers.

Probably the best remedy for this condition is through organization building before the startup begins, so that people establish good working relationships and personal bonds strong enough to keep them trying to solve problems openly when the pressure is on. Training in formal methods of problem solving also help, because people get to know one another's ways of working, and because it gives them a common language and approach that can be invoked to depersonalize the disagreements that inevitably arise. Training in meeting management and in confrontative, problem solving approaches to conflict resolution are also worth considering.

When conflicts do become personal and those on both sides become stubborn and irrational, it helps for someone to intervene to bring them together. One of the functions that evolved for me in one startup was to take pairs or triads offsite for lunch discuss their differences. The neutral ground, the healing process of eating together, and the nonpartisan concern of a third party were frequently enough to break the deadlock. It did not matter that I had no understanding of the technical issues. My ignorance made it easier not to be seen as taking sides.

Startup and Stress

Startups are stressful because they create a high degree of pressure for success, and they involve high costs of failure and considerable task uncertainty. Up to a point,

the pressures actually enhance performance. We all perform better when the job is important and we are anxious enough about the outcome to pay attention, stay alert, and give our best. Under long, continuous pressure, however, depressive reactions set in as individuals run out of reserves and the body demands withdrawal for recuperation. When high pressure becomes chronic in an organization, a pattern of stress reducing behaviors develops that helps members cope, but is dysfunctional for organization performance. Readers familiar with startup will recognize most of them:

Activity levels remain high, but problem solving decreases. Productivity remains high on simple, routine activities, but the quality of thinking and learning deteriorates.

Time perspective decreases. People go for short-term solutions that will alleviate current pressures without taking long-term costs into account.

Perception narrows. There is a noticeable decrease in the number and variety of solutions to problems that people consider before acting. They deal with individual problems as isolated entities, without taking other, related problems into account. Problem solvers resist the introduction of new data and stop their investigations too soon.

Cooperation and helping decrease. People have enough problems of their own without worrying about someone else's.

Blaming and avoidance of responsibility increase. It becomes easier and more satisfying to criticize others than to take the risk of doing something about the problem. When risks are taken, they are more likely to be impulsive and economically unjustified. The impulsive act becomes a release from pressure and uncertainty. Even if it fails, it lowers the pressure.

Stress symptoms increase and withdrawal occurs. Some people become apathetic or discouraged; some may develop mild to severe emotional upsets or psychosomatic disorders that cause them to stay away from work.

A counterbalancing factor is the strong commitment to organization goals and the high team spirit that frequently develops during startup. People willingly endure long hours and unpleasant working conditions, sacrificing family life and other outside interests to meet the needs of the startup. In fact, a norm of loyalty and commitment that causes people to make unnecessary sacrifices may develop. People stay on the job when they are not needed because they want to "be a part of it all ." People come to feel that if they are not overworked, they are not doing their job. They refuse rest, and they show up on the job even when they are not needed—when both they and the work would benefit from their taking some time off.

The costs of stress are consistently underestimated in managers' thinking about startup. Except in a few dramatic instances—for example, when one manager began hallucinating and pushed the wrong button, or when another succumbed to a heart attack—I have not been able to convince managers of the high cost of stress. Such

stress-related behaviors as slow problem solving, indecision, impulsive risk taking, and avoidance of planning tend to be typical of poor management anywhere, and who can say what is stress related and what is due to incompetence and lack of experience But then, incompetent managers are not usually selected for key startup roles. So my money is on stress as the root cause of startlingly poor management performance in startup.

Here are some suggestions for controlling stress in startups:

Planning and "overkill" in startup preparation. The best way to control stress is to prevent it from happening. The entire system and the people in it will work best if they are well prepared. The cost of exhaustive contingency planning, providing reserve human and material resources, doing a thorough job of training, and organization building is modest compared with that of a few days saved in a highly complex and capital intensive system. Such systems probably start up best if, during preparation, they are treated as though they were "moonshots." (In a moonshot, you only get one chance to succeed!)

Selective use of management pressure. Paradoxically, pressure and directive control during startup can actually reduce stress. Where there is good structure—that is, clear plans, directives, rules, and procedures—performance can be enhanced, and the stress on the individuals involved may actually be reduced. It makes people feel secure and confident to have a boss who knows exactly what to do in a tense situation (such as in the startup and testing of

high-pressure systems or high speed rotating equipment), and who makes sure that everything is done just right. By reducing the number of alternatives, providing people with the certainty that what they are doing is correct, and reducing their personal responsibility, a directive manager can lower stress levels.

However, the choice to apply directive pressure must be based on an accurate diagnosis of the problem situation. As mentioned above, in situations where structure is unclear and cannot be made clear, high pressure for performance has a negative effect. Situations that call for painstaking diagnosis and insightful problem solving, and in which the solution is needed yesterday, are exacerbated by management pressure to produce. The participants are usually highly motivated and doing their best to start with, and their problem solving capacity is already reduced by their own sense of urgency and the knowledge that everyone is waiting for them to come up with the answer. What is needed here is support, calmness, and management action to shield the problem solvers from outside pressure and interference. Of course, if the problem does not yield, it may be necessary to provide more help or different problem solvers. But up to the point where such action is required, added pressure is unlikely to be constructive.

Providing for social support. Stress and pressure disrupt performance most when one has to bear them alone. During a startup, people are frequently

brought in as spare resources, advisors, and consultants with little thought given to their integration into the organization. In my experience, people who have not been integrated into some kind of group demonstrate lower morale and effectiveness than those who belong to an organizational "home." This is another argument for bringing people in early and building teams at the outset.

Counterbalancing the "commitment culture." In order to feel accepted, people work long hours and endure fatigue uncomplainingly. The norms about sacrificing personal time are probably inevitable in a cohesive startup team, but they need checks and balances. Some fairly high-status person or staff group should be given responsibility' for monitoring fatigue and visible signs of stress, for directing people to take time off and for delegating some of their work to subordinates. Members of a medical department would seem logical choices for this role, if they have enough credibility and clout. Organization consultants can also influence management in this direction.

Techniques for reducing one's own stress. There are many relaxation and meditation techniques that people can use to reduce their own stress, and there are effective programs that teach these. Like any training that deals with deeply ingrained habits and personality patterns, however, these programs are most likely to be effective when the individual participant is highly motivated. It is also important that there be a long enough lapse of time between the training and the need for its application to enable the person to develop the new skills

and habits to the point where they will work for him or her. There is of course little point in giving people training that cannot be applied because organizational norms are strongly opposed to it.

Career Development and Startup

Startups are stressful tests of persons and organizations. In any such test, some people fail to function well in the roles they have been given, either because the role was not well conceived or because the individual is not suited to its demands. Each startup probably has its share of career casualties resulting from poor planning, bad luck, or personal inadequacy.

When a person performs badly during startup, management has few options. Normally the individual might be given additional training and/or brought along through a combination of counseling and closer supervision. Unfortunately, training with a developmental orientation (as opposed to informational or technical skills training) is not effective when the individual who receives it is under high stress. Under pressure, we tend to cling to familiar ways of dealing with people and problems, even though we may know they are dysfunctional. We choose the "devil we know" even if it leads to sure disaster.

In a startup, we are much more likely to be able to salvage the situation by restructuring the role or reassigning individuals than we are by developing the person. There are often some roles in a startup that hardly anyone could perform effectively, and it is much more economical (and certainly more humane) to change the role than it is to waste two or three managers before deciding that we are demanding too much

of them. If we prepared for the startup by some kind of team building around mutual role definition, we would be less likely to have such "killer roles" in the organization – and even if they should crop up, we would have accepted processes and skills in place to renegotiate and modify the organization to better fit people's capacities.

The process of changing the responsibilities attached to a role is made much less traumatic and damaging to the career of an individual who is not performing well if the startup roles are defined as temporary and somewhat fluid in the first place. The more rigid the role and the more formal its definition, the greater opprobrium will be attached to having it changed. Leaving the roles somewhat flexible and open to change and renegotiation permits management to avoid black marks on the performance record of otherwise competent managers who have the bad luck to be given unpredictably punishing assignments. Because most organizations have a long memory for failure, we can keep valuable careers alive by being vague in defining startup roles.

Caveat

I must comment on one paradox about human and organizational performance during startup. Such an operation brings out team spirit, a sense of excitement and dedication, and a commitment to high organizational ideals that' is often missing in the daily life of most organization members. Indeed, a difficult startup can give its participants a sense of living life to the full.

By contrast, consider what Dr. Horsley (Horsley, 1973) has to say about the factors important to the highly successful startup cited earlier. He identifies "overkill

and control" as the "two main attributes of the startup," followed by overmanning, team building, organization development, bringing people onto the project early, contingency planning, and problem-solving training. He concludes, "In retrospect, many of these activities are bureaucratic, boring, and expensive, but not as costly as failures or delays. It is also evident that the fun and personal satisfaction of being in the thick of things, having a tremendous degree of responsibility, working long hours, and so on, are not efficient ways to start up a plant. The paradox is that, in fact, an efficient startup, without the emergence of numerous challenging technical problems will probably be slightly dull and disappointing to technologists and experts."

Could it be that so many startups are confusing, difficult, prodigal of human and material resources, frustrating, exciting, stimulating, and enjoyable because managers and engineers really like it that way?

Helping the System

Some managers call upon consultants to advise and help them in managing startups. The question of whether to employ consultants at all is beyond the scope of this article. What I want to do here is to offer some guidelines on how consultants may be used effectively during startup if they are employed, and offer some wisdom acquired from painful experience about the inappropriateness to startup of certain organization development activities that are often used with "normal" or steady-state organizations.

I referred earlier to production oriented organizations as tending toward rigidity and resistance to needed change. Accordingly, many consulting techniques

and methods are oriented toward "unfreezing" rigid systems, humanizing them, and making room for individual creativity and personal fulfillment. In my early startup consulting work, I carried this tool kit with me and quickly learned that it was easy to overuse it. Interventions designed to loosen or shake up rigid structures are not generally useful during a startup.

Startup consultants need skills in helping managers design, build, and manage effective structures, because the startup organization is often inadequately structured. It needs building up, not weakening. As my colleagues and I became more attuned to the client's needs, we found ourselves helping the managers clarify their procedures, resolve boundary disputes, strengthen role definitions, and run meetings more crisply so that they would be able to arrive at clear-cut decisions.

Helping managers run meetings effectively is a decided contribution, because many of the managers and engineers who are attracted to startup see themselves as rugged individual contributors rather than as team members. But they can learn to run much more effective meetings if coached on such matters as building an agenda, drawing out the quiet members, testing for consensus, and delegating responsibility for implementation.

Consultants are well advised to focus on task rather than interpersonal issues during startups. Under the pressure of startup people are not very interested in interpersonal issues unless they get seriously in the way of doing the job. The technical system is too exciting, too demanding, and too threatening.

We learned a few other things that can help managers and consultants deal constructively with each other. For instance, we found that the stress of startup greatly increases managers' sensitivity to criticism, so consultants need to be less confronting and more supportive than in a more typical client/consultant relationship. They need to make finer judgments about the level of stress the system and its people are under, and match their contributions to their clients' "felt needs." When this occurs, the perceptions of the managers involved may shift—from an initial view of the consultant as "part of the problem" to a view of him or her as a problem solver.

This is not to say that startup managers do not need any help with interpersonal relationships. They do, especially where there are mismatched styles, misunderstandings, power conflicts, and petty irritations. But unless people really feel themselves seriously frustrated, and their work is suffering because of interpersonal difficulties, they are usually willing to put up with such minor inconveniences. The tendency is to shelve interpersonal concerns "for the duration," just as a nation at war ignores its internal squabbles to make common cause against the enemy.

Instead of drawing attention to interpersonal issues, the consultants' best approach is to offer services in a quiet way to those in conflict to help them resolve boundary disputes between their roles, to negotiate settlements around authority and responsibility, and to help them learn to live with others' abrasive personal styles. Whenever possible the focus should be on the task component of a conflict, leaving the interpersonal aspect to work itself out. Thus many interpersonal conflicts are not

so much resolved as they are lubricated. Such lubrication can do much to help the organization and its members get through some stressful times.

Last, we found that once a startup has begun, you are more or less stuck with the organization. You can tinker with the roles and change the people around, but any major changes in concept will seriously disrupt performance.

Managing the System's Boundaries

I have discussed the startup system as though it were more or less independent of the larger organization of which it is a part. This is a dangerous oversimplification. Relationships with that larger system are always important, and they may make or break the startup effort.

The subsystem that is starting up is often culturally deviant from the larger organization. It has high task uncertainty and is undergoing rapid change compared with the relative stability of the larger organization's long-established operations. Its members develop a short time perspective: Planning deals only with the next few days, or hours, while the rest of the organization continues to think in terms of months and years. Roles and relationships are fluid and temporary in the startup; people move in, do their jobs, and move on. Often, the pressure under which people operate is much greater than that which they could or would tolerate in a job with a longer time frame. To members of the larger organization, a startup system organized according to the principles of a modified matrix and dealing with one crisis after another appears disorderly, inefficient, and difficult to control. To the startup people,

the larger system may appear bureaucratic, rigid, and oriented toward tight control at the expense of high performance.

Cultural differences lead to conflict; conflict and misunderstanding often occur between a startup system and the larger organization. These are further exacerbated by the unclear role boundaries between the new or temporary startup organization and the larger system. There is seldom a consensus about the demarcation of each group's responsibility and authority, and considerable confusion develops about who is supposed to do what to whom.

When things are going well, the differences between the startup system and its organizational parent may be no more than annoying. When the startup is difficult, the conflicts become serious. They often center on needs for information and control. The parent organization needs to know what is going on, how its money is being spent, and why things are not progressing according to schedule. If the startup slips badly, it needs to know who is responsible and to determine whether additional help is needed, and whether key personnel should be replaced.

The startup organization needs the freedom to adapt, to learn from its mistakes, and to change its plan with the rapidly changing shape of its problems. It needs to protect its members from undue pressure and fear of failure so that they will be able to direct their energies to problem solving and away from a defensive protection of their positions and careers. These differing needs can create enormous conflict and misunderstanding.

Because the startup and parent organizations are different cultures and have such different needs, they perceive and react to events differently. For example, startup teams normally make quite a few mistakes. The mistakes can be regarded as experiments necessary to the process of learning. From the point of view of the parent organization, however, they are more likely to be seen as signs of incompetence and failure.

The parent organization naturally wants to help. When things are going badly, it will frequently send specialists and advisors to provide assistance. However, startup team members are often unable to use the help, because they are already overloaded. Their information processing capacity cannot cope with additional advice, suggestions, problem diagnoses, and so forth, without neglecting something they are already doing. The outsiders are viewed as "part of the problem" unless they are adept at fitting their help unobtrusively into what's already going on.

The parent organization wants to know how things are going so that it can provide help, update production plans, and make management changes, if necessary. The startup organization may tend to restrict communication, tell the parent organization what it wants to hear, and become unresponsive to requests for more information. This is partly because people are simply so busy *doing* that they can't be bothered with *reporting*. Partly it is fear of evaluation and interference. It is a major source of tension between startup and parent organizations, especially when the startup is located far from the home office. When the people at home get nervous

about the lack of information, they may send emissaries; the emissaries may be treated as spies, and the cycle of mistrust escalates.

These sources of conflict cannot be eliminated, but they can be planned for and managed. Some suggestions for doing so are given below.

Select a person who has credibility in both the startup and the parent organization to act as a liaison between them. Both organizations should perceive that the liaison person has competence in and knowledge about the task at hand and isn't being sent in merely because of his or her position and power. This person's role and career path should be such that he or she is strongly motivated to contribute to the success of the startup, but is not too strongly identified with the people in the startup organization. The person will have to be an effective communicator, able to influence through negotiation, persuasion, and problem solving, rather than through the use of formal authority.

Equalize authority between the connecting roles. Have the startup organization report to a manager in the parent organization who is at a level equivalent to or not much higher than that of the startup manager.

Formalize contacts with the startup organization. Negotiate in advance who will control access to the startup site and what procedures visitors must go through in order to be admitted. Legitimize the startup organization's

resistance to unwanted help, and specify the conditions under which "help" will be imposed.

Clarify in advance what the tolerances are in target dates and budgets. Let startup managers know how much maneuvering room they have to get themselves out of trouble before the roof falls in. (I am sure this guideline will be strongly resisted by managers who feel that any "give' in the targets is an invitation to schedule slippage and cost overruns. Their attitude underestimates the team spirit and drive that are typical of startups.)

Establish a norm of resolving conflicts and disagreements between startup and parent organizations through confrontation, problem solving, and negotiation. Establish how and by whom differences will be resolved. Avoid the use of naked power and authority except as a last resort. This will contribute to more open communication and to mutual learning between the two systems.

Establish in advance how progress is to be communicated and by whom. Respect these channels, and use informal communications sparingly and with discretion.

These guidelines will not totally eliminate conflict between startup and parent organizations because such conflict is built into the cultural differences between them. However, it is important to recognize the causes of the conflict and to plan in advance to manage it through structure, systems, and management attention. Those involved in such endeavors should recognize that conflict is not primarily a function

of personalities, and they should avoid making individuals scapegoats by blaming them for individual mishaps.

Startups Are Learning Organizations

There is one central message in these various threads of reflection, experience, and speculation about startups. It is that the complex startup of a new organization is a special task that requires its own organizational structure, systems, staffing, and management style. Starting up a complex production or service delivery system is not simply a slightly more difficult case of running that type of system. It is a qualitatively different task.

That fundamentally different quality has to do with learning. In a complex startup the need for everyone to learn a great deal very fast hangs over and presses in upon each operation and management decision. The startup differs from the normal, steady state organization in that it is a "learning system." Its central purpose is to learn to operate, in contrast to the steady state organization that is oriented toward control and efficiency.

Because managers are not used to thinking of production or service delivery organizations as learning systems, the accumulated experience of startup participants tends not to be fully understood or well used to improve future startup efforts. This experience does not fit well into the "mind maps" that managers have about relatively steady state organizations. When the startup is viewed as a producing system, its values and costs are seen very differently from what they are when interpreted as part of a learning process. For example, mistakes and failures in a producing system are

taken as a sign of lack of skill, ability, or judgment. A failure during a learning process is more likely to be seen as a trial or experiment. The one is judged on what it cost; the other is evaluated on the knowledge gained, *and* what the learning cost.

Learning is a qualitative endeavor; production is more quantitative. These differences in point of view can be very great indeed. Seeing a complex startup from the point of view of production can be like looking at an archeological "dig" from the point of view of a construction foreman: "Why are they using those little spades and brushes when we could just get a power shovel in here and clear this whole area in about half a day?" The production orientation leads to overpowering the startup problem with resources; the learning orientation leads to studying the system until the key is found that will unlock it.

Of course, neither caricature represents a balanced approach to startup. The object of the exercise is, at the end of the day, to produce, and the startup is not simply a laboratory for specialists to study technical problems. My point is simply that if the management decisions that must be made about the structure, systems, staffing, and management style of a startup are made from the point of view of creating the most productive learning system consistent with cost, then startups will progress better.

Furthermore, the organization will begin to accumulate a body of principles, knowledge, and experience about how to create and manage effective learning systems, and it can apply this to other startups. The experience acquired on each startup will be retrieved and retained, because it will fit meaningfully into the developing "mind maps" managers have about building temporary learning systems.

Events and processes that are not categorized crudely as "bad luck," "poor judgment," "incompetence," and the like will be understood in the light of their part in the pattern of learning and problem solving. Instead of being discarded and forgotten, these data will be used to redesign, fine tune, and operate future startup learning systems that will become much more sophisticated and powerful than those we use today. It is in the hope of stimulating the creation of these more powerful systems that this article is offered.