Instructional Technology and Organization Development

A Still Valid Case for Collaboration

by

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and

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Foreword

A little more than 25 years ago, the authors were part of a small team of Navymen that was presented with a major challenge by the leadership of the human resources management consulting organization where we both were stationed. We were much younger then and far less wise in the ways and wiles of organizations. One of us was a dyed-in-the-wool instructional technologist and the other was a self-declared "humanistic psychologist" with a Ph.D. in leadership and human behavior. Both of us were well-trained internal organization development (OD) specialists. The stakes were high; some thought the future of our consulting organization depended on meeting the challenge, which was described to us as urgent, important and more than a little risky. Indeed, the senior officers presenting the challenge did so with all the gravity of a high-stakes wartime mission.

The charge was to create and then test the operational feasibility of a short-term, high-impact, "canned" change program, one that would be flexible, tactically oriented and focused on organizational improvement. The program was to be "exportable" and usable with any type of Navy unit with equal effect. This "holy grail" of the Navy's Human Resource Management Program (HRMP) had never before been realized and was a desperately wished for capability on the part of the Human Resource Management Center (HRMC) in San Diego, California, where the authors were stationed, and on the part of the program headquarters organization at the Navy Department in Washington, D.C.

The goal was to produce "something" (as in "We need something…") that could utilize the output of a previously administered, organization-wide survey.[1] This "something" could then somehow translate the numerical results of the survey into practical, organizationally valued, measurable results. The "translation" was to occur via some kind of structured, repeatable intervention.

What ensued was quite remarkable. All the team members were from very different experiential and academic backgrounds and orientations. Hard pressed by unrelenting circumstance, they engaged in an intense, collaborative design and development effort. This effort drew on all the team members' experience and synthesized the best of its individual members' knowledge (mainly instructional technology, OD and the culture and politics of the United States Navy). The rest was created from scratch, "engineered" so to speak. When the dust settled, the team had produced a highly synergistic, behavioral change program capable of producing consistent results across a wide variety of Navy units. This, of course, had Navy-wide implications.

The preliminary results of this collaborative effort were presented at the Twelfth Annual Convention of the National Society for Performance and Instruction on April 18, 1974 in Miami, Florida. Back then, the relationship between Instructional Technology and Organization Development was marked with a reserve that bordered on professional hostility. Although one of us was a bona fide instructional technologist, both of us were active OD practitioners, and making a presentation to a group of professional instructional technologists felt very much like being Daniel in the lion's den. We were, however, treated with courtesy and respect and our presentation appeared to surface genuine curiosity as well as portend the possibility of future collaborations.

Never officially published, the paper we presented was abstracted in the *JSAS Catalog of Selected Documents in Psychology*, 1975, 5, 247 (MS. No. 955). That abstract serves as a good overview of the substance of this paper.

> *A discussion of the rationale, basis and results of collaboration between instructional technologists and organization development (OD) specialists in planned change efforts is presented. The first section deals with the similarities between the two disciplines – the rationale for collaboration. The second section outlines basic system theory and presents a simple system model – the basis for collaboration. The third section describes a collaborative effort in planned change with Navy units – the results of collaboration. The authors conclude that collaboration widens the scope of applicability of instructional technology and provides an additional dimension*

[1] Indeed, for quite some time the "something" was referred to simply as "The three-day thing." There was method to this madness. Giving it a name too soon would have invoked mental models and other forms of mindsets that would have led to pigeonholing the intervention and perhaps forestalled its further development. But, as long as it remained unnamed, the developers remained in control.

of workability to organization development. The applicability of certain methods and techniques from instructional technology are pinpointed and their application is described. The results achieved are broad-scale based on both objective and subjective data.

Why revisit ancient history? In a nutshell, it's still relevant. We believe our story about collaboration between instructional technologists and organization development specialists offers four areas of interest and value to current organization development practitioners.

- First, the effort generated a good and useful model, one that is consistent with Kurt Lewin's dictum that there is "nothing so practical as a good theory."

- Second, the original work and its subsequent refinement, contain insights that are relevant to current practice.

- Third, the "collaborative effort" referred to in the abstract above became the Command Action Planning System (CAPS). CAPS was one of the first, large-group, organization-wide, survey-guided interventions. There is still much "high-grade ore" to be mined from it.

- Finally, what was learned is a good case study in — and case for — the careful, thoughtful, systematic and collaborative design of organization development interventions intended to demonstrably improve organizational performance.

So, without further preamble, let's begin our story about an important collaboration between instructional technologists and organization development specialists.

Introduction

The title of this paper implies a condition that to some may seem preposterous. After all, why should anyone propose the joining of such apparently diverse fields? Each discipline is an independently successful product of today's highly industrialized nations. Each specialty is the child of accelerating technology, the postpartum evidence of deep-seated pressures for change endemic in modern society. Both fields are relatively young and vigorous and, for the past several decades, have been experiencing rapid growth and expansion (although there is some evidence that both might be approaching a more mature phase in their respective life cycles). So, why propose collaboration?

This paper has two central points with respect to that question: First, that collaborative relationships between instructional technologists and organization development (OD) specialists are natural and inevitable; and, second, such collaborative relationships hold the promise of significantly increasing the effectiveness of organizational change efforts.

To address the first point, we will examine several similarities in the disciplines, especially what appears to be a common heritage. To demonstrate the potential for increased effectiveness, we will provide a brief outline of what we see as the basis for collaboration (i.e., systems theory) and then describe a product of a collaborative effort in the United States Navy: the Command Action Planning System (CAPS).

Evidence of A Common Heritage

The historical roots of both instructional technology and OD can be partially traced to the military. Shoemaker (1969) indicates that at least one beginning of instructional technology can be traced to the work on task analysis and instructional systems done in the military during the 1950s. French and Bell (1973) point out that the laboratory training stem of OD, which eventually grew into the National Training Laboratories (NTL), was initially financed by the Office of Naval Research. The numerous studies, projects, and grants funded by and involving the military indicate at the very least an interest by the military in both instructional technology and OD. That interest extends sufficiently far back into time that the military serves as one point of origin for both disciplines.

An ever-increasing focus on performance in the form of human behavior is a striking commonality between the disciplines. The realization among OD specialists that organizational behavior consists of complex patterns of individual behavior is evident in Bowers' (1973) statement that:

> "…it is well to remember that these 'processes' (e.g., organizational decision-making practices) are simply shorthand descriptions for perceived constellations of the behavior of many individuals at various points in organizational space." (p.7)

The work of Mager (1962) and Popham (1966) with respect to focusing instructional outcomes on learner behavior is well known and requires no elaboration here. However, the rationale for focusing on behavior will receive coverage. Gagne (1965) describes four basic reasons for describing instructional outcomes in terms of learner behavior:

> *Revealing the Nature of the Terminal Behavior*. Specifying terminal behavior allows the instructional designer to know what is to be learned. The instruction can then be designed toward this end.
>
> *Specifying Postlearning Behavior for Measurement*. The specification of learning outcomes in measurable terms allows a reliable determination to be made of whether or not the outcomes were in fact achieved.
>
> *Distinguishing the Varieties of Behavior Which Can Be Modified by Instruction*. Behavior can be classified, and each classification carries implications for the conditions required for learning.

> <u>*Defining the Reinforcement Situation for the Learner*</u>. Making the terminal behaviors known to the learner allows the learner to carry out the matching function required to obtain reinforcement. Further, it seems that the learner is to at least some extent then able to program his own activities.

Gagne's rationale for stating instructional outcomes in terms of the learner's behavior seems equally applicable to the design of organizational interventions and organization change efforts.

Not only do both disciplines concentrate on behavior, but both specialties also seem to view behavior in much the same light (i.e., in terms of individual and environmental variables). McGregor (1967), following social psychologist Kurt Lewin, expressed the performance (P) of an individual in an organization in the following equation:

$$P = f\,(I_{a,b,c,d\ldots}E_{m,n,o,p\ldots})$$

Kolb, Rubin and McIntyre (1971) support this multivariate view of behavior when they write:

> "One of the most widely accepted and important insights of social psychologists is that behavior is a function of the person and his environment." (p.73)

There has long been a corresponding recognition among instructional technologists that individual behavior is a function of individual (I) and environmental (E) variables. The *acquisition* and *maintenance* categories of behavior change posited by Brethower (1967) and expanded upon by Mager and Pipe (1970) demonstrate this recognition. Instructional technologists and OD specialists seem to view the individual as neither *independent of* nor *dependent on* the environment but, rather, as *interdependent with* that environment.

That interdependent view of behavior may be one of the underlying factors in what we perceive to be another similarity – the choice of change strategies. Chin and Benne (1969) suggest three basic strategies for change:

> <u>*Empirical-Rational*</u>. Men are rational and will follow their rational self-interest. Change is attempted by proposing the change and demonstrating that the proposed change is in line with the self-interests of the change targets.
>
> <u>*Normative-Reeducative*</u>. Rationality and intelligence are not denied; however, behavior is viewed as supported by socio-cultural norms and commitment to these norms. Change is attempted by getting individuals to change their normative-orientations and by developing commitment to new ones. Change requires modifications in attitudes, values, skills, and significant relationships, not just new knowledge or information.
>
> <u>*Power-Coercive*</u>. Change is accomplished through the application of power in some form. The change process is one of enforcing compliance by those with lesser power with the wishes of those holding greater power. The power to be applied is usually legitimate power or authority.

There is a connection between the three strategies and three basic views of the individual. The Empirical-Rational strategy assumes that the individual is independent of his environment. The Normative-Reeducative strategy recognizes interdependency with one's environment, and the Power-Coercive strategy patently asserts that one is dependent upon his environment. Although it may or may not be based on an interdependent view of the individual, we do see a tendency among instructional technologists and OD specialists to rely on the Normative-Reeducative strategy for change whereas we see many managers relying on some mix of Empirical-Rational and Power-Coercive.

Whether the change in question is one of modifying the behavior of an individual or of altering the behavior patterns of an entire organization, the issue is still the same – how does one obtain movement from the current or projected state of affairs to the desired state of affairs? This is the basis for the well-known and widely-used "gap" approach to problem solving and change management. Change, then, is the "core process" of both instructional technology and OD. With respect to behavior change, one might conceive of the instructional technologist operating primarily at the individual or micro-level, and the OD specialist operating at the organizational or macro-level. Overlapping of the disciplines occurs at the level of the group or the work team.

Whether at the micro-level of the instructional technologist or the macro-level of the OD specialist, both disciplines are concerned with changing behavior. Both disciplines prefer an interdependent view of the individual with his environment and both choose their change strategies accordingly. It is possible to look at these approaches to behavior change in graphic form, thus illustrating one basis for collaboration (Figure 1).

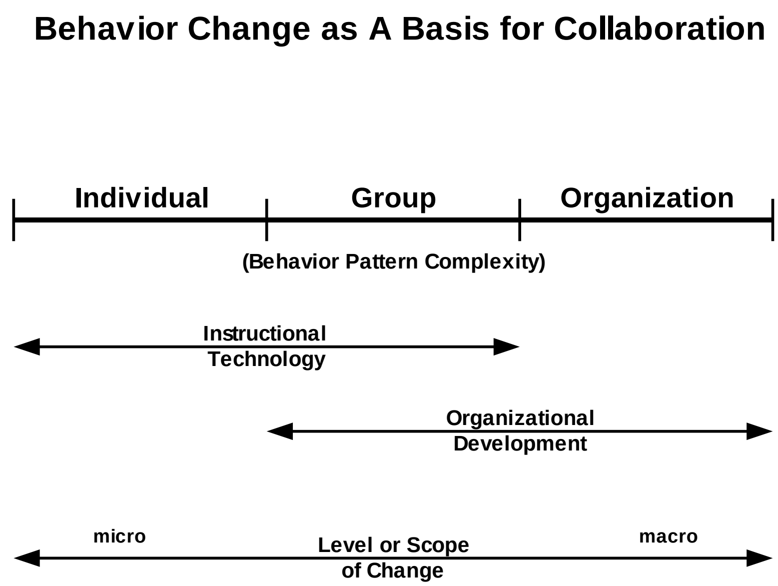

Figure 1

The continuum represents the complexity of behavior patterns to be considered in a change effort, with individual behavior being the least complex and organizational behavior the most complex. Adding the normal domain of activities for each discipline helps to clarify their relationship and to illustrate the overlap at the group level. The level or scope of change effort illustrates their micro-macro relationship. The fact that instructional technologists and OD specialists are both in essentially the same business (i.e., that of changing behavior) provides a strong rational basis for collaboration (as well as the enhanced potential for "turf" wars).

If the business of change is to be a responsible one, then at some point the issues of accountability and professional ethics must be raised. An insistence on professional accountability is becoming more predominant in both disciplines. Deterline (1971) describes accountability in education as follows:

> "Accountability imposes three directives: specified performance capability will be produced; the instructional components must produce those results; and an empirical development and management process must be employed." (p. 28)

Bowers (1973) suggests a similar requirement in OD when he writes:

> "…responsible change practice requires that one must be able to say that a particular treatment produces the condition which it is intended to produce." (p.20)

One must be able to identify the intended outcomes of an organizational intervention with no less clarity, validity and reliability than can be done for an instructional sequence. It is in the area of accountability that taxonomies of behavior such as those presented by Gagne (1970) and Tennyson and Merrill (1971) can perhaps be coupled with taxonomies of diagnosis and intervention as prescribed by Harrison (1971), French and Bell (1973) and Bowers (1973). This matching could serve to have the "treatment" match the "condition" and thus improve the accountability of change efforts in both disciplines. Regardless of the methodologies used, the truly responsible practitioners in both disciplines seem to welcome and to advocate accountability.

One might speculate that accountability brought about the application of systems engineering techniques to OD and instructional technology or one might take a stance quite the reverse. At any rate, both instructional technology and OD have been increasingly utilizing (in one form or another) what has come to be called the "systems approach."

The works of Banathy (1968), Corrigan (1969) and Kaufman (1964, 1968, 1970, and 1972) are examples of such applications in education. The treatment of organizations and their development in system terms is illustrated by writers such as Katz and Kahn (1966), Lawrence and Lorsch (1967, 1969) and Bowers (1973), to name but a few. Whereas mathematics has long been the common tongue of the physical sciences, system theory seems well on its way to becoming the currency of the behavioral sciences. As Robert Chin (1969) notes:

> "…the system model is regarded by some system theorists as universally applicable to physical and social events, and to human relationships in small or large units." (p.299)

System theory seems to provide both a language and a rapidly growing technology ideally suited to bridging whatever gaps may exist between the micro-level of the instructional technologist and the macro-level of the OD specialist. Peter Senge (1990) has identified systems thinking as a key change discipline.

When one looks at the similarities mentioned thus far with respect to the two disciplines, it becomes readily apparent that both fields are moving ever closer to a common purpose – that of *systematically changing human behavior*. It is this "common purpose," coupled with their similarities, that forms our final point concerning the naturalness and inevitability of collaboration between instructional technologists and OD specialists.

Lawrence and Lorsch (1967) made an intense study of the impact of differentiation (division of labor) and integration (coordination of labor) on the behavior of individual organizational members. They define integration as:

> " – the quality of the state of collaboration that exists among departments that are required to achieve unity by the demands of the environment." (p.11)

If one substitutes *discipline* or *practitioner* for *departments* in the foregoing definition, one can then see that the requirement for collaboration among instructional technologists and OD specialists is a function of environmental demands for the unity of their effort. Given our earlier position that both instructional technologists and OD specialists are concerned with the systematic changing of human behavior, it is also our contention that collaborative relationships should be effected *before* environmental demands force such an integration. As Kaufman (1970) points out:

> "The concept of change surrounds us these days, and much in education has been written about it. Change is inevitable; the question educators must face is whether we will help to shape it as participants, or whether we will be swept along as spectators." (p.123)

Assuming that similarities between the two disciplines would indeed facilitate collaboration, there are as yet many unanswered questions. What would be the theoretical basis around which collaboration might occur? What integrative devices could be used? What has been attempted thus far and with what results? Simply put, we think system theory provides the theoretical basis and the system model an integrative device. The Navy's Command Action Planning System (CAPS) provides an example illustrating the increased effectiveness achieved through collaboration in organization change efforts.

Open System Theory

System theory presents a theoretical basis for collaboration between instructional technologists and OD specialists with which members of both disciplines are familiar. However, we caution against confusing the application of systems engineering techniques with the application of system theory. Kaufman (1970) expresses a similar concern when he differentiates between the *system* approach (singular) and the *systems* approach (plural). Our intent in addressing system theory is not to define it but to present our understanding of certain of its aspects. Our rationale for addressing system theory has been more than aptly put by Bowers (1973) who states:

> "That the systems viewpoint has had considerable currency is demonstrated by the increasing frequency with which writers and practitioners in the field [OD] have referred to it in what they write and say. Unfortunately, not all who recognize its general value also accept its substance. The thoughtful implementer, no less than the casual observer, is faced with the problem of

differentiating those who identify the truly systemic from those formulations which merely attempt to identify with it." (p.5)

What, then, is a system? Current system definitions tend to focus on the tangible form or physical structure of a system. This is evidenced by the inclusion of words such as "parts," "elements," "components" and other "things" in current definitions. Beckett (1971) comments at length on the weaknesses of such definitions. This focus on physical structure may be a carryover from the closed-system theory of the physical sciences where system boundaries are clearly defined. Katz and Kahn (1966), citing the work of Allport (1962), point out that, in a social structure, where physical boundaries in the usual sense are non-existent, it is events as well as things that are structured. Thus, social entities (groups and organizations) may be profitably viewed as comprised of cycles of events as well as collections of interdependent elements. It is from this energic flow point of view that we have developed the following definition of systems:

Systems are patterned cycles of events, consisting of inputs, transformations, outputs, and transactions for new inputs to complete the cycle.

The cycle of events that comprises a system is in fact carried out by various entities. In social or socio-technical systems these entities are usually men or machines or some combination of the two. However, one must not confuse the entities with the system. The system is a cycle of events that may involve many and various entities in its execution and closure. These entities may be replaced by other entities, yet essentially the same cycle of events will persist. This cyclic nature of a system can be graphically illustrated (Figure 2).

A System as A Cycle of Events

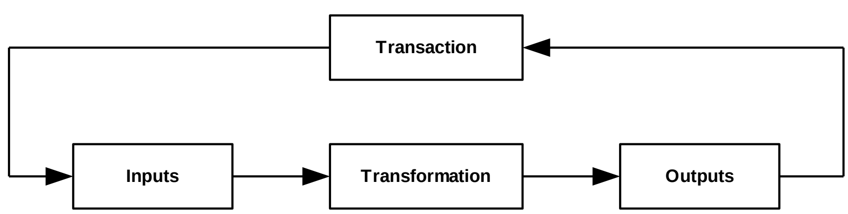

Figure 2

A system may be considered as having two phases – the *transformation phase* and the *transaction phase*. In a system at its simplest, one entity may execute the transformation phase while a second entity executes the transaction phase. A baker who barters bread with a miller for flour offers a very simple, yet illustrative example. It is the making of flour, the making of bread and the exchange of the two that constitutes the system, not the baker, the miller, the flour or the bread. The cycle of events constitutes the system, not the entities involved. Thus, the "wholeness" or *gestalt* of a society, organization or group lies not in some mystical attribute that separates the whole from the sum of the parts but in the closure and reinitiation of a cycle of events.

When you apply a system viewpoint to social entities (e.g., organizations or groups), you immediately encounter many far-reaching implications. Chief among them is the requirement to consider the interaction of the entity with its environment. The environment actually consists of other entities; the term environment is simply a convenient way of collectively referring to all these other entities. As a given entity cannot exchange its outputs with itself for new inputs (and it is the transaction phase that closes the cycle), it is obvious that it takes a minimum of two entities to have even the simplest of systems. Together, in interaction, those entities can carry out a cycle of events that is characterized by closure and reinitiation.

Entities in Interaction

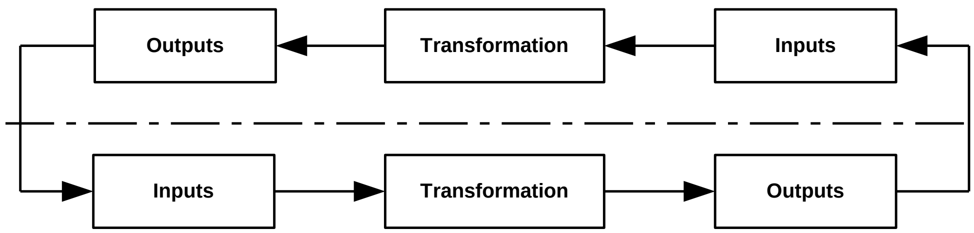

Figure 3

Several points are readily apparent when one examines two entities in interaction (Figure 3). The first point is rather glaring in that the transformation and transaction phases are basically identical (i.e., each entity in the system receives inputs, transforms them and thus produces outputs). "Transformation" and "transaction" are terms used to distinguish between phases in a system, however, these phases are basically the same (i.e., the operations of the entities involved in each phase is the same). Other points that can be derived from examining entities in interaction are:

- The outputs of a given entity serve as inputs to other entities.
- The outputs of a given entity are a function of its inputs, the transformation process and the *input requirements of other entities.*
- The inputs to a given entity are actually the outputs of other entities.
- The inputs to a given entity are a function of its output requirements, its transformation process and the *output capabilities of other entities.*
- The survival of any entity is a function of its ability to *continue to meet its input requirements*.

It is from this "an input is an output is an input" relationship that the meaning of interdependency begins to take on clarity. Lawrence and Lorsch (1969) termed This exchange of outputs for inputs constitutes a "contributions-inducements" relationship, something that has occupied serious organizational thinkers for more than 50 years (Barnard, 1947; March & Simon, 1958; Cyert & March, 1963; and Lawrence & Lorsch, 1969). This relationship implies that one cannot examine a given entity's outputs and inputs with respect to that entity only. One must also consider which outputs are exchanged with which other entities for which inputs.

Katz and Kahn (1966) demonstrate two categories of inputs: maintenance and production. They write:

> "*Maintenance inputs* are the energic imports which sustain the system; *production inputs* are the energic imports which are processed to yield a productive outcome." (p.32)

A second point, then, is that in examining a given entity (organization, group or individual), one must also analyze the input-output transactions in terms of which *kinds* of outputs are exchanged with which *kinds* of entities for which *kinds* of inputs.

The very idea of maintenance-input requirements suggests that the ability to survive is a major parameter of any social entity and the performance assessment of any organization, group or individual must take into account the interactions with other entities. Seashore and Yuchtman (1968) conducted an intensive examination of seventy-five organizations in an attempt to isolate and identify variables that could be used as measures of organizational performance. They concluded by saying:

> "We define the effectiveness of an organization as its *ability to exploit its environment in the acquisition of scarce and valued resources to sustain its own functioning*." (p.186)

One key to survival for social entities is the ability to obtain the inputs required to continue functioning. We hasten to add that there might or might not be a contingency relationship between outputs and inputs. But this criterion does address one aspect of the entity – its interaction with the environment (other entities). However, there is another aspect to be considered: the transformation process.

Banathy (1968), in writing about instructional systems, indicates that within system (entity) boundaries can be found both *content* and *process*. "Content" refers to tangible resources while "process" refers to the function(s) in which content engages. It is this resource-function relationship that characterizes the transformation phase of a system's cycle of events (Figure 4).

Expanded View of the Transformation Phase

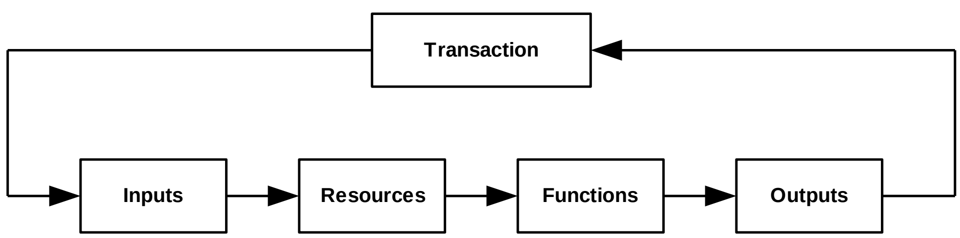

Figure 4

As was the case with the transaction phase earlier, a number of points can be derived from an examination of the transformation phase.

- There is a given range of inputs for which a specified output can be exchanged (it is unlikely that you can trade a bale of cotton for a new automobile).
- There is a given range of functions that will result in a specified output (the end result of drilling, bolting and welding is *not* a bale of cotton).
- There is a given range of resources that can accomplish a specified function (pressing, wrapping and strapping a bale of cotton will not be accomplished by a mechanic with a 3/8" socket set and torque wrench).
- There is a given range of inputs that can be utilized by a given transformation process (if you're in the business of producing cotton bales, you probably don't want to trade them for a new automobile anyway).

The entity is efficient to the extent it does not waste energy in producing its outputs. If the transformation process is overly wasteful, the entity will make inordinate demands of its environment for inputs. This can result in such unsatisfactory transactions with other entities in the system that survival itself can be endangered. A second parameter for the effectiveness of any social entity is then related to its output-input ratio. Bowers (1973), in developing a taxonomy of interventions for OD efforts, addresses this aspect of organizational effectiveness when he writes:

> "Although persons may, for reasons of background, information, and the like, hold in fact as ideal any of an almost infinite variety of functional configurations, the one which they should hold, if their concern is for the well-being of the organization, is one which maximizes the output-input ratio." (p.8.)

One obvious way to maximize the output-input ratio is to hold outputs constant and increase inputs. With respect to this particular point we should like to modify Bowers' maximization of the output-input ratio to include a concept of optimum inputs as a limitation. Seashore and Yuchtman (1968) suggest such a requirement when they write:

> "The second qualification is that the ability to *exploit* the organization's environment cannot be equated with *maximum use* of this ability in the short run, for an organization might then destroy its environment and reduce its longer-run potential for favorable transactions. We must invoke an *optimization* concept." (p.186)

Considering systems as cycles of events and entities as the means whereby that cycle is executed, allows us to place our two parameters in perspective. The complete cycle of events that comprises a system consists of two phases. The first is the transformation phase. The ability of the entity to maximize its output-input ratio within optimal input limitations applies to this phase. The second phase is the transaction phase. The ability of the entity to obtain the inputs necessary to sustain its own functioning applies to this phase. One must remember that even in the simplest of systems (a cycle of events executed by only two entities), both criteria apply to both entities. It is this fact that makes open negotiation between transacting entities an absolute must if both are to be assured of continued functioning.

A System Engineering Model

Assuming that system theory provides an abstract basis for collaboration between instructional technologists and OD specialists, one must still arrive at some concrete integrative device. One means for translating abstractions into concrete form is through the use of models. We think the system engineering model that follows provides at least one integrative device that supports collaboration between instructional technologists and OD specialists.

The utility of a model is, by definition, a function of the extent to which people use it as a guide for their activities. This suggests some general criteria for models such as simplicity, range of applicability, and adaptability to the idiosyncrasies of the user. We feel the model that follows meets these criteria.

The model is partly based on one originally developed during the design of the navy's Programmed Instruction Writer's Course at San Diego, which in turn was derived in part from the work of Kaufman (1964, 1968) and Banathy (1968). The model has been used as an operational basis for instructional system development (Nickols, 1971); as a theoretical basis for determining OD strategies (Cameron, Rush and Nickols, 1972); and the creation of an action-planning intervention for OD efforts with individual naval units (Trygsland, Forbes, Guido and Nickols, 1973). The problem solving/planning process developed from the basic model is also being used in the development of affirmative action plans in the Navy's race relations and equal opportunity programs.

Rooted in system theory, the model provides a framework around which Navy instructional technologists and OD specialists have been able to collaborate in planned organizational change efforts. The model is based on a logical analysis of the functioning of an open system. Briefly, the analysis states that the system's action or operation is typified by the following stages:

1) Inputs are received, which combine with existing content to form

2) Resources, which are utilized to execute

3) Functions, which when completed, yield

4) Outputs, which, if acceptable, can be exchanged for

5) Inputs, which closes and reinitiates the cycle.

However, the planning of a system must proceed in reverse order (i.e., from the output stage and work backward through functions, resources and inputs). When one connects the planning and action phases, the following system model is the result (Figure 5).

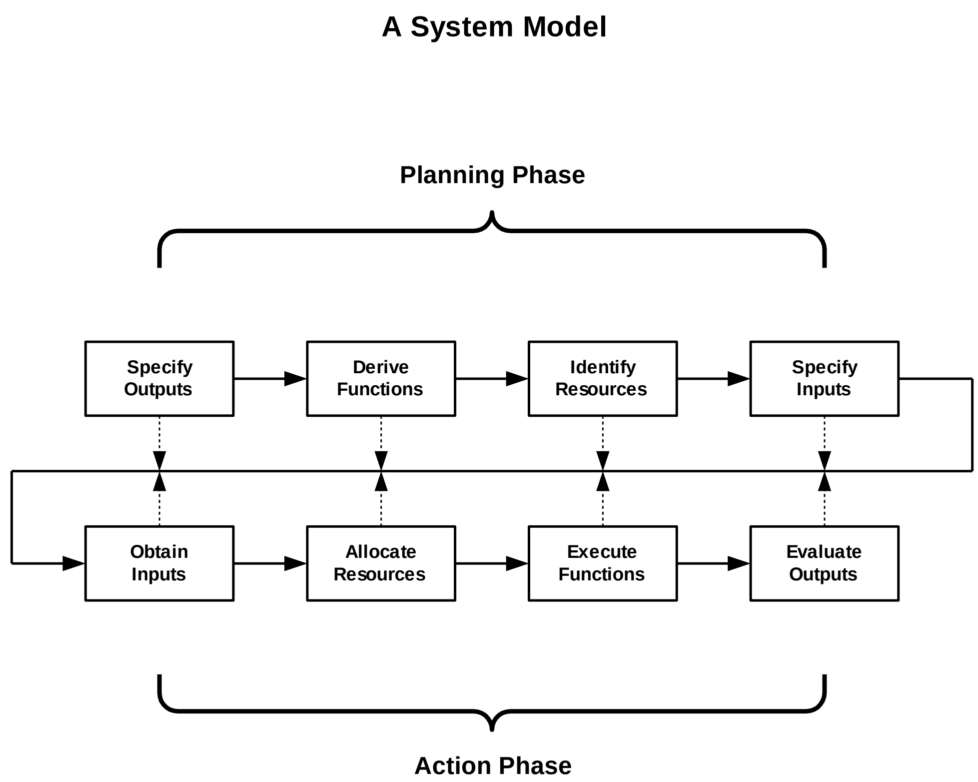

Figure 5

Although we will not describe the model in great detail, there are a few points to consider, especially with respect to the planning phase.

- Specify Outputs. Keeping in mind that an output is also an input, the specification of outputs must consider two factors: (1) the output capabilities of the producing entity; and (2) the input requirements of the receiving entities. Measurability is a critical issue, as agreement on intended outcomes will be reached on the basis of the measures or criteria by which it will be possible to distinguish between acceptable and unacceptable outputs – NOT the words used to describe them.

- Derive Functions. Production functions must be derived from an analysis of intended outputs. Maintenance functions can be derived from an analysis of the nature of the entity. If the intended production output is a frame for a programmed instruction text, and one of the criteria for frames is that all information presented must be relevant to the response to be made, then certain functions become apparent: (1) criteria for determining the relevance of the prompt to the response must be established; (2) the prompts and responses contained in frames must be checked against those criteria; (3) frames must be accepted or rejected and (4) if rejected, the frame, the criteria or both must be modified until a match exists.

- Identify Resources. Again, a form of logical, derivative analysis is used. If the function to be performed is one of typing, then obviously such resources as typewriters, typists, paper, etc., will be required.

- Specify Inputs. This is basically the difference between what the producing entity already has in the way of resources and what it requires in order to produce the intended output(s). At this point, the level of commitment to the system can be tested. There is sometimes a discrepancy between what people say they want and what they will in fact expend energy and resources to obtain. The issue of the real value of desired outputs comes into the open as one begins to negotiate for inputs on the basis of those outputs.

We do not intend to imply that the system model provides a step-by-step process that guarantees success. We know of no “cookbook” approaches that are effective. It is our experience that the system model provides a “common frame of reference” for people with varied backgrounds, skills and values. We consider the system model more as a guide and channeling device for the energies and talents of diverse specialists than as a set procedure for doing something. At least such is the manner in which the utilization of system theory and the system model was perceived by the authors in their application of it. That application is the subject of the next portion of this paper.

A Collaborative Effort in the United States Navy

The Navy’s early organization development process (Forbes, 1977) was built around the technology of survey-guided development. Individual Navy units (e.g., ships, aircraft squadrons and shore stations) were regularly scheduled (roughly every three years) to undergo an organizational improvement experience. The experience was administered by organization development specialists operating in teams from consulting centers located in areas of fleet concentration (i.e., Newport, Rhode Island; Norfolk, Virginia; San Diego, California; and Pearl Harbor, Hawaii). The 88 question Navy Human Resource Management Survey was administered to all unit members. The results were computer scored, analyzed and fed back by organizational level. The unit was then scheduled for three days at the participating consulting center to work on the survey findings.

It was through the development of the prototype of the survey-guided Command Action Planning System (CAPS) workshop at the Human Resource Management Center, San Diego, that we first became aware of the potential inherent in collaborative relationships between instructional technologists and OD specialists. That awareness came as the result of seeing that several concepts and techniques from instructional technology were widely applicable to an organizational change intervention such as CAPS.

In this section, we will attempt to answer the following questions: What is CAPS? How was CAPS more effective as a result of collaboration than might otherwise have been the case? Finally, what results have been obtained with CAPS?

What is CAPS?

CAPS is basically a systemic – and systematic – problem-solving and planning process. CAPS is designed to take a group of key leaders from a given organization and have them generate data relevant to current organizational issues; then process that data through a problem-solving and planning procedure. CAPS produces three major outputs: (1) a Command Action Plan; (2) participants with newly-acquired skills; and (3) information about how the organization and its members function.

A typical Command Action Plan has the following characteristics:

- Diagnostic. The plan is based on data about current blocks and barriers to more effective organizational functioning.

- Measurable. The plan contains objectives, and standards for assessing the attainment of those objectives, including time-tied milestones.

- Accountability. The plan specifies who is responsible for actually accomplishing any action steps; it also specifies management responsibilities.

- Realistic. The plan is limited to actions that can be implemented within current organizational resource constraints, and to areas over which the organization exercises control.

- High Ownership & Probability of Success. The plan is conceived and developed by key organizational leaders and other members, and modified through advance "troubleshooting."

Skill acquisition by the participants occurs in primarily four areas. Participants acquire the ability to (1) conduct rudimentary diagnoses of organizational and group functioning, (2) conduct effective meetings, (3) manipulate the CAPS process to identify and resolve organizational issues and (4) utilize evaluation as a means of obtaining feedback for revision purposes (as opposed to the administration of punitive measures).

Information generated during CAPS generally relates to how the organization is functioning (e.g., the content supplied by participants) and how the members function (e.g., the processes by which they develop that content).

As stated earlier, the three primary outputs of CAPS are a Command Action Plan, relevant organizational skills and data pertinent to organizational and member functioning. The sequence of events or functions whereby these outputs are produced can be broken into three major stages: (1) pre-workshop: (2) workshop; and (3) post-workshop.

Pre-workshop functions consist of the following:

- Senior Participant's Pre-Brief. The senior participant is prepared for his role in CAPS (which is crucial to its success).

- Staff Team Building. The personnel who will facilitate the workshop clarify expectations, make role assignments and conduct facilitator training as required.

Actual functions executed during the formal workshop are:

- Workshop Opening. Introductions, senior participant's opening remarks, participant questions, administrative details, workshop ground rules, glossary of terms and workshop overview.

- Problem Identification. Develop "I Want" lists, present lecturette on effective meetings, develop "We Want" list, develop problem statements, develop objectives and specify standards for objectives.

- Problem-Solving & Planning. Identify possible courses of action, select proposed courses of action, troubleshoot proposed courses of action, write action plan elements and integrate action plan elements.

- Workshop Closing. Human Resource Management Center input, senior participant's closing remarks and final critique by all participants.

Post-workshop functions are:

- Summative Evaluation. Product outcomes are checked against pre-established criteria, senior participant prepares evaluation letter, staff critiques workshop, follow-up contact is scheduled and executed and evaluation data are compiled.

- Modification and Revision. Evaluation data are analyzed, discrepancies identified, and modification proposals are generated. Modifications are tested then incorporated.

The CAPS process is a survey-guided or data-based, facilitated, systematic problem-solving process supported by thoroughly trained OD consultants acting as consultants and enablers. The participants provide relevant content and the workshop staff facilitates the process. Together, they produce realistic solutions to organizational problems.

A number of resources are required to conduct a CAPS workshop, however, we will not provide a complete inventory here. Instead, we will comment on only two – the time frame for CAPS and the participant mix.

Navy units operate under numerous and severe time constraints. Operational commitments are heavy and reduced manning does not allow much time for any activity that is not obviously related directly to mission accomplishment.

CAPS was designed to fit what appeared to be the maximum time frame most units would allow for an unknown quantity such as CAPS (i.e., three days).

The participant mix (who attends) is one of the more significant aspects of CAPS. The workshop is designed to have four small groups from a given organization. The four groups represent each layer of the organization – top management, middle management, line management, and the work force. Within each group can be found a lateral slice of the organization represented. Each group is also composed of both the formal and the informal leaders of the organization. Thus, participant input reflects vertical and lateral as well as formal and informal aspects of the organization's structure.

How was CAPS more effective as a result of collaboration?

It is our judgment that CAPS is more effective as a result of collaboration than would otherwise have been the case. Our judgment is based in part on the large number of concepts and techniques from instructional technology that were successfully applied during the development of CAPS. The paragraphs that follow indicate what some of those concepts and techniques were and to what end they were applied.

The derivation and specification of workshop outcomes and performance parameters benefited greatly from the concepts and techniques of instructional technology. A modified version of the process proposed by Kaufman (1970, 1972) was used to derive the three-faceted needs assessment that formed the design basis for the workshop. The concept of behavioral objectives served to make the workshop outcomes measurable. Criterion-referenced testing was the key concept used in the design of evaluation measures and devices.

The development of workshop functions was accomplished through a modified task analysis procedure. The concept of "fading," borrowed from programmed instruction, manifests itself in the built-in transfer of group leadership from staff to participants. Another programming technique, that of retrogressive chaining, was utilized as a sequencing aid in developing staging directions for staff performance. The concept of active and relevant responding serves as a screening device to ensure that non-essential functions are never inserted into the CAPS process.

The desired participant mix for CAPS was identified using a reversed target population analysis. Target population analysis was also utilized to ensure that CAPS materials are at the level of the participants. The concept of relevant subject matter was used to ensure that only required information is contained in the facilitator's guides and participants' handouts. Behavioral analysis found application in determining what that subject matter should be.

Evaluation and feedback makes use of both formative and summative evaluation. The requirements for field-testing and validation were lifted from the developmental process for instructional systems and imposed *in toto* on the CAPS management process.

Many other examples could be listed but those given above will suffice to illustrate the broad applicability of concepts and techniques from instructional technology to organization change efforts. It is important to note that it was system theory and the system model that allowed those applications to take place. System theory provided a language with which specialists from the two disciplines were able to communicate and the system model provided the integrative device for their efforts.

Although we attribute much of the effectiveness of CAPS to the collaborative effort that created it, the collaboration is not the measure of CAPS' effectiveness. The effectiveness of CAPS is found in the results it produces. These results were both predictable and surprising.

What results did CAPS achieve?

The predictable results have to do with the intended workshop outcomes. These outcomes and their actual results are as follows:

- <u>Action Plan</u>. At last count, more than 100 CAPS workshops were conducted for Navy units and, in all 100, the plan was produced in accordance with specifications. In all but two or three of these instances, the action plan was also successfully implemented by the command. These action plans dealt with problems ranging from unsatisfactory living conditions aboard ship, through environmental pressures such as upcoming overseas deployment, to disruptive morale and disciplinary problems.

- Skill Acquisition. Skill acquisition was assessed in part by the participants' ability to execute the CAPS process unaided. The last half-day of a CAPS workshop usually provided this opportunity and participants inevitably demonstrated that ability. Follow-up contact with receiving units indicated that the skills required to execute CAPS are incorporated in the repertoires of participants and they can be observed applying these skills in their daily work situations.

- Command Information. The information generated about organizational and member functioning generally served to identify hitherto unknown talents and resources in current organization staffing and to provide the top managers (and others) with a microcosmic view of the entire organization in operation. The top manager had the opportunity to see his key subordinates in "live action" and most senior participants reported that this experience alone made the three days worthwhile.

- Attitudes. The CAPS developers were particularly pleased with the results obtained in the attitudinal area or affective domain. An intended outcome of CAPS in this respect was stated as "an increased sense of potency" on the part of the participants. A considerable body of evidence, both subjective and objective, indicated that the achievement of this outcome was reliably and effectively achieved.

In addition to achievement of the intended outcomes, CAPS yielded some results that were not at all anticipated. A few of the more significant follow:

- The Human Resource Management Center at San Diego, where CAPS was developed, was suddenly inundated with requests from fleet units for CAPS workshops. The CAPS system was "exported" from the San Diego center to the other Navy consulting centers and their consultants were trained in its use.

- The Navy's Race Relations program adopted the CAPS process, shortened it and applied it to the development of affirmative action plans for equal opportunity. As a result, they reported what they consider genuine progress in that area.

- CAPS became one of the cornerstones of the Navy's Human Goals Program. CAPS' success with fleet units resulted in it being made an integral part of the Human Resource Management Cycle which was subsequently required of all fleet units on a periodic basis.

- Spin-offs or by-products of CAPS, as reported by receiving units in follow-up contacts, include improved vertical and lateral communication within the organization (which we attribute to the "shared experience" of CAPS), better interpersonal relationships in and between organizational layers, and improvements in overall morale and organizational performance. (One ship moved from "last" to "front runner" within a large fleet command. The ship's commanding officer attributed a large part of that improvement in performance to the CAPS workshop.)

Accounting for Success

The CAPS phenomenon appears to us to have been highly successful for three basic reasons.

- First, the entire approach was systemic in nature (i.e., environmental demands were identified, outputs specified, functions derived, resources identified, and the process then implemented and modified until performance was satisfactory).

- Second, the collaboration that occurred between the instructional technologists and the OD specialists allowed a comprehensiveness of effort and yielded a degree of effectiveness that otherwise would have been impossible. In turn, we believe the collaboration was made possible by the cross-disciplinary aspects of system theory and the integrative capabilities of the system model.

- Third, the CAPS process was essentially consistent with the cultural values of the larger organization. The participants — the members and the leaders of the unit in question — were not being asked to do anything foreign or strange or odd. They were instead asked to identify and "work" issues related to the performance of their unit and, just as important, they were helped by people who shared their beliefs, values and objectives.

The basic similarities between instructional technology and OD provide a powerful rationale for collaboration. The two disciplines are in essentially the same business — systematically changing human behavior and improving human and organizational performance. System theory, the system model and an approach that approximates what is known as "system engineering," supply the language and the technology through which such efforts can be effected. Our own experience indicates that such attempts are well worth the required expenditure of resources.

We have learned much since our first attempt at collaboration and we remain convinced that it is a sound idea, one whose time is in many ways still to come. We have also refined many of our initial ideas — and had more than a few disconfirmed. In the next section, we'd like to share some of our further learning.

Afterword

We believe the organizational world of the early 21st century is characterized by heightened levels of ambiguity and that it is influenced by burgeoning technology, internationalization, ever-accelerating change and intense pressures for quick responses. In this milieu, both Instructional Technology and Organization Development have struggled mightily to adjust and maintain their relevance. Both fields seem to be undergoing an intense, never-ending self-scrutiny and both are seriously examining their purposes and professional identities.

Innovative, change oriented practitioners dealing with practical problems in the marketplace of ideas appear to be creating techniques that outstrip any underlying theory. New sets of stakeholders question prevailing values. OD, in particular, seems bent on incorporating the perspectives and tools derived from many other areas (e.g., complexity theory, chaos theory, creativity, open space technology and the spiritual disciplines). For example, see the work of Anderson (2000), Davis and Meyer (1998), Holman and Devane (1999), Owen (1997) and Turner (1999).

We would like to claim that the past 25 years has blessed us with 20-20 hindsight but that kind of vision is a myth. The best we can hope for is a clearer sense of our own biases and prejudices, and for the illuminating, thoughtful perspectives of others regarding the few, small trails we might have blazed. We do like to think of ourselves as "reflective practitioners" and there are some reflections we believe are worth sharing. Some of the more enduring lessons learned follow:

- **Pain Drives Change**. Despite all the words written about the purposeful planning of opportunistic change, the reality seems to be that perceived organizational pain is the primary inducement for organizations to change their ways. This might be pain in the "here and now" or the perceived and perhaps imminent threat of pain in the future. In either case, organizational leaders typically articulate the need for change in terms of the pain felt by or about to be felt by the organization — and its members.

- **Rationality is Illusory**. Most organizations go to great lengths to preserve the illusion that they are governed by logic and reason. The frequently heard call to demonstrate the ROI of this or that intervention is but one example. In our experience, organizational decisions are made and problems are solved as often by covert, political means as they are by overt, rational ones. On this count, we think OD practitioners have an edge, because instructional technology was and still is a hyper-rational discipline.

- **Adoption and Integration Obviated Collaboration**. Much of our motivation in writing this paper (the original and this, the updated version), stemmed from a belief in the inevitability of collaboration. We thought that collaboration would be forced upon both disciplines by a demanding clientele. We were wrong. On the one hand, the OD specialists have moved into and some might say they dominate the training community. On the other hand, the instructional technologists have moved on to performance technology and, in the course of doing so, have incorporated much of what was once considered the domain of OD specialists. For this, one need look no further than the web site of the International Society for Performance Improvement (ISPI), the host to our 1974 presentation (http://www.ispi.org). There, one will find a diagram or schematic of human performance technology that subsumes organizational design and development as but one of several options under the heading of "intervention selection and design."

- **Systems Aren't Necessarily Systematic**. With the emerging insights of chaos theory, it appears that organizations function at their very best on the border between order and chaos (Stacey, 1992; Waldrop, 1992). The consistently repeatable, tightly sequenced, step-by-step processes of "scientific management" are not characteristic of today's dynamic human systems. People and their needs make those systems we call organizations very "messy" places.

- **Systems are More Social than Technical**. One of the "tap roots" of organization development is the socio-technical perspective or the notion that organizations are best understood as combinations of social and technical subsystems. Many diagnostic and intervention strategies have been built on the idea of relative parity between the human side of an organization and its technical component. Our experience tells us that the "human side of enterprise" is more of a determinant of an organization's destiny than the technological side. In really effective organizations, people drive technology and make it subservient to their wishes, not the other way around.

- **Survival Depends on Inputs**. Long term, successful organizations appear to focus more on establishing a secure flow of inputs in the form of financial, technological, material and human resources (including knowledge) than on output products or services. This is no doubt because any system's survival depends on its inputs, not its outputs. Only when an enforceable, contingent relationship between outputs and inputs can be established do outputs matter. Consequently, organizations are extremely sensitive to the transaction processes that enable them to obtain the inputs necessary for their survival. In this same vein, we have both observed that people, purpose, core technology, core competencies and established reputation might all be abandoned when survival is at stake.

- **A Focus On Performance**. Both disciplines have come to emphasize performance (see Kaufman, et al, 1997 and McMaster, 1994). The instructional technologists have become specialists in individual performance and the organization development community has focused more on how to better achieve organization-level performance. (There is still room for collaboration.) Additionally, both fields still value learning as a means for attaining their objectives. There is also much evidence of cross-pollination in the form of practitioners who now have a foot firmly planted in both fields and who can act as conduits and bridges between the two. The exemplar in this regard may well be Geary Rummler. Rummler is a noted human performance specialist with roots in instructional technology who is also renowned for his work at the organizational level (see his 1990 book, *Improving Performance: How to Manage the White Space on the Organization Chart*, co-authored with Alan Brache).

- **A Fourth Change Strategy**. To the three well-known and longstanding general change strategies set forth by Chin and Benne, we would add a fourth: Environmental-Adaptive (Nickols, 2000).

> *Environmental-Adaptive*. People oppose loss and disruption but they adapt readily to new circumstances. Change is based on building a new organization and gradually transferring people from the old one to the new one.

The fourth strategy is the product of one of the author's own experiences during some 30 years of making and adapting to changes in, to and on behalf of organizations. Instead of trying to persuade, reeducate or coerce people into changing within the confines of an existing system, the strategy is instead one of creating a new system or organization in parallel and gradually transferring people out of the old one into the new one. In this way, people are confronted not by change to their organization but by the requirement for them to adapt to an existing (even if new) organization.

An excellent example of this fourth strategy in action, albeit on an accelerated basis, is provided by the way in which Rupert Murdoch handled the printers of Fleet Street. He quietly set about building an entirely new operation in Wapping, some distance away. When it was ready to be occupied and made operational, he informed the employees in the old operation that he had some bad news and some good news. The bad news was that the existing operation was being shut down. Everyone was being fired. The good news was that the new operation had jobs for all of them — but on very different terms. That there are also elements of the Empirical-Rational and Power-Coercive strategies at play here serves to make the point that many successful change efforts inevitably involve some mix of all four basic change strategies.

- **It's the Process, Stupid!** Finally, if we have learned anything, we have learned that the surest, quickest route to improved performance lies in a path that must traverse and take into account the organization's processes. This is true whether one chooses the "blunt weapon" reengineering approach of Hammer & Champy (1993), the "kinder, gentler" approach advocated by Davenport (1993) or the more conventional approach set forth by the likes of Juran (1964) and Harrington (1991). This focus on processes includes the "soft" processes that have occupied OD specialists for many decades now as well as the "hard" processes that have been at the center of management's attention for almost as long. Yet, process improvement remains one of the more difficult undertakings faced by those who would help the management of an organization improve its performance. To even correctly identify an organization's processes is a task fraught with difficulty (Nickols, 1998). But, if there is a "commons" where instructional technologists, performance technologists and organization development specialists can meet, share ideas and insights, and collaborate in improving organizational performance and the human condition, that "commons" is to be found in the processes of organizations.

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