Catalyzing Interfunctional Efforts to Find and Creatively Solve Important Business Problems

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Dr. Min Basadur

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ABSTRACT

Many companies today are sensing that important changes in how they conduct their business are needed if profit levels are to be maintained and improved.

With the slowing of growth and intensifying competition, acceleration of productivity improvement has emerged as a clear business need. Cost improvement and new managerial skills needed for the increased complexities of the business are important issues.

In many companies which have thrived on functional excellence and organizational efficiency, the need to expand managerial competence in the following new ways is being increasingly recognized:

- More idea generation and thought leadership
- More horizontal leadership and teamwork
- More strategic thinking

In the following pages, a unique, proven, managerial productivity process is described which helps maintain profits in spite of challenging inflationary and market pressures. The centerpiece of this productivity process is a trainable thinking process called a "Complete Process of Creative Problem Solving" (Basadur, Graen and Green, 1982). This process is action oriented, facilitates teamwork and team leadership, and develops thinking skills and attitudes for taking problem solving initiative and idea generation and implementation. It is a practical, research-based process (Basadur and Finkbeiner, 1985; 1983a; 1983b; Basadur and Thompson, 1983). It expands beyond the kind of thinking skills and attitudes prevalent among most North American managers.
PROGRAMMED VS. NON-PROGRAMMED DECISION MAKING

There are two very different kinds of problems and decisions people encounter in business, industry, and their personal lives. The first kind is of a more "programmed" nature. Solutions to this first kind are based on rigorous training on the job or in school, experience, analytical skills and knowledge of rules and procedures pre-designed to handle similar situations.

The second kind are of a more "non-programmed" nature. Solutions require additional skills such as problem sensing, problem definition, fact gathering, seeing different points of view, and creating and selecting from diverse options. They require the use of the imagination, non-linear thinking and some risk-taking. They usually have never been encountered before and have no pre-set rules and procedures to guide their handling. They are sometimes caused by changing circumstances. Such problems are typically less structured, unpredictable, and ambiguous as to "what is wanted". Often the main job is to discover and define "what is wanted" because no one really knows. Often sensing, anticipating and defining the problem is much more difficult than solving it.

In today's rapidly changing business environment, managerial skills in both of the above kinds of problems are vital for effective performance. Unfortunately, our traditional formal training addresses primarily the former, the more "programmed" kind of problems. We tend to learn formulas, problem "types" and rules and procedures. The focus of the "Complete Process of Creative Problem Solving" is to help with the second kind of problem which is less structured and less programmed and where higher level initiative, imagination and tolerance of ambiguity is vital. The process
enhances problem initiation, solution, and implementation skills in non-programmed decision-making.

**ADAPTABILITY**

Research shows that highly productive organizations have three major characteristics in common (Mott, 1972).

1. **Efficiency** (the ability to organize for routine production)
   - High quantity of "product"
   - High quality of "product"
   - High output/input (O/I) ratio

2. **Adaptability** (the ability to organize to change routine)
   - Anticipating problems
   - Staying abreast of new technology
   - Prompt acceptance of new solutions
   - Prevalent acceptance of new solutions

3. **Flexibility** (the ability to organize to cope with temporary emergencies and maintain the routine)

**Efficiency** is the ability to organize for routine production. A routine is something that we do over and over again. It's the standard or the process prescribed by which we carry on the business of marketing, selling, recruiting, selecting, promoting, rewarding, starting up equipment, shutting down equipment, funding capital expansion, designing and building warehouses, running distribution systems, etc. Every organizational sub-unit is turning out some kind of "product" (a needed good or service) and has a "routine" to do so. **Efficient** organizations are very good at carrying out their routines. They produce a high quantity of product, high and
consistent quality of product, and have a high output over input ratio. In addition to being efficient, productive organizations are also flexible, that is that they have the capacity to cope with, to respond to and react to temporary changes or interruptions and maintain the routine. They can deal with interruptions and get back to normal routine and highly productive work. **Flexibility** thus can be lumped in with efficiency. They are both necessary in the short run.

**Adaptability** is a longer range characteristic. Adaptability refers to an organization's capacity to intentionally change its routines and to find new, ongoing, better ways to do the business that it does. Adaptable organizations anticipate problems and develop timely solutions ahead of time. They stay abreast of new methods and technologies externally that are applicable to the activities inside the organization. They promptly accept new good ideas and make sure that new solutions and new techniques get installed and maintained until they become new efficient operations. The acceptance is widespread and prevalent across all the organizational subunits.

**Efficiency** requires more programmed thinking skills and is consistent with solution implementation performance. Adaptability requires more non programmed thinking skills and is consistent with problem finding and problem defining performance. **Flexibility** is more of a blend, and is consistent with problem solving performance.

Non-programmed thinking skills become more vital as the amount of change confronting the organization increases. Up until recent times, many organizations could be effective and productive by concentrating only on
efficiency and flexibility. However, today, adaptability becomes just as important and must be given equal weight.

This leads to the following (deceptively) simple equation:

Productivity = Efficiency* + Adaptability

(*includes Flexibility)

Adaptability and efficiency are different skills. Efficiency means optimizing, stabilizing and polishing current procedures to get highest quantity and quality and lowest cost possible with those procedures. Adaptability means changing current procedures to make quantum jump improvements in quantity, quality and cost. This means new procedures.

In a way, adaptability is a "dynamic efficiency" where efficiency represents velocity and adaptability is acceleration.

To summarize:

High efficiency means excellent Mastery of the "Routine" while high adaptability means high Rate of Change of the "Routine".

In pursuing high efficiency we are highlighting and measuring absolute performance. In pursuing adaptability, we are highlighting and measuring progressive rate of change. The most effective organization would be the one which combined highest efficiency (e.g., as measured by lowest cost) with highest adaptability (e.g., as measured by highest progressive rate of lowering cost). We can plot this concept as in Figure 1.

Many organizations have developed as high efficiency, low adaptability organizations (see Figure 1A) with predictable technology and markets. In the past several years, with rapidly accelerating changes in technology and
markets, organizations have been seeking ways to achieve a better balance (see Figure 1B).

Figure 1

THE ORGANIZATIONAL EFFECTIVENESS GRID

EFFICIENCY: (e.g., Absolute Cost)

Adaptability Only (10,0)

Neither (0,0)

Efficiency Only (0,10)

Lots of Both (10,10)

Some of Both (5,5)

ADAPTABILITY: (e.g., Rate of Improvement in Cost)
Figure 1A
PREDICTABLE TECHNOLOGY AND MARKETS

EFFICIENCY

ADAPTABILITY

Figure 1B
RAPIDLY CHANGING TECHNOLOGY AND MARKETS

EFFICIENCY

ADAPTABILITY
COMPLETE PROCESS OF CREATIVE PROBLEM SOLVING

The problem-solving process trained to achieve the shift toward higher adaptability is based on two major concepts. First, it is seen as having three different stages. It separates problem finding from problem solving and from solution implementation. The second important feature of the process is that within each of the three critical stages, there is a common fundamental two-step thinking process called "ideation-evaluation." Ideation is defined as idea or option generation without evaluation or logic (putting aside the judgment and analytical capabilities). This is the diverging aspect of the two-step process. Evaluation is the reverse. It is defined as the application of judgment and logic to the generated ideas or options to select the best one(s). This is the converging aspect of the two-step process. Both aspects are believed essential to creativity.

Many people are distrustful of training in creativity because they believe creativity is synonymous with abstract idea generation and excludes practicality and implementation (Levitt, 1963). However, newer approaches to the study and application of creativity not only include problem solving, but also solution implementation and problem finding (Basadur et al, 1982). Increasing numbers of researchers emphasize that creative problem solving involves not only the solving of problems, but also the finding or initiation of problems (Mackworth, 1965). Problem finding includes opportunistic surveillance (Simon, 1960) and problem definition (Dewey, 1977).

Unfortunately, much of the university training of North American managers and professionals has been much more analytical than creative
(Leavitt, 1975; Taggert and Robey, 1981). This is especially true of engineers (MacKinnon, 1962). Engineering students have been found to lose ground in their creative thinking skills during a standard four-year university curriculum (Altemeyer, 1966; Doktor, 1970). Some universities have recognized this problem recently and are offering courses in creative thinking in Business and Engineering (McKim, 1972; Weick, 1977). Simon, Newell and Shaw (1962) consider creative activity as a special class of problem solving characterized by novel and unconventional thinking, persistence, and problems which are vague and undefined initially (such that part of the task is to formulate the problem itself). Creative problem solving requires the skill of thinking that on the surface appears to be impractical, temporarily separating such thinking from the opposite, seemingly more practical, kind of thinking.

Guilford (1967) distinguishes between convergent thinking and divergent thinking. The former involves logical, mathematical thinking to solve "single correct answer" problems; the latter involves the use of the imagination to generate ideas to solve problems which have many possible correct but different answers. Taggert and Robey (1981) describe right and left brain activity as a physiological explanation of the divergent-convergent thinking duality. Guilford suggests that the need for divergent thinking production is characteristic of creative problem solving. Similarly, de Bono (1971) distinguishes between vertical and lateral thinking. Many other writers present various versions of what creative problem solving is. Most describe processes requiring the use of the imagination to create novel solutions to problems. Some also emphasize the
discovery of problems and the implementation of solutions (Osborn 1963; de Bono, 1971; Prince 1970; Gordon 1971; Parnes, Noller and Biondi, 1977; Leavitt, 1975; Mackworth, 1965; Getzels, 1975; Basadur, 1982). Some people believe that creative problem solving performance and innovation can be increased by training (e.g., Simon, 1960; Joyner and Tunstall, 1970). While this belief has generated some research into understanding and testing of processes of creative problem solving, most of the training effort has been put into developing training programs by practitioner-oriented people based on partial processes or unresearched concepts and techniques (MacKinnon, 1977). Some such programs can cause negative attitudes toward creative problem solving (Grossman, 1982).

Basadur, Graen and Green (1982) provide empirical evidence that it is worthwhile to train people in a complete process of creative problem solving which takes into account both divergence and convergence and problem finding and implementation as well as solution finding. They also show that such processes are partly attitudinal and partly cognitive. Basadur (1979) provides a model showing how the attitudinal and cognitive effects of such training relate to one another and to creative performance in organizations. Basadur and Finkbeiner (1985) identify more precisely those attitudinal processes and provide scales to measure them. They point out that inadequacies in these attitudes prevent people from using cognitive creative processes on the job.

Two attitudinal concepts are "preference for ideation" ("active divergence") and "tendency to make premature critical evaluation of ideas" ("not deferring convergence" or "preference for quick convergence"). A
person with a high "preference for ideation" ("active divergence") would likely find value in novelty and unusual "wild" ideas, seemingly far removed from the current problems; enjoy taking different points of view about a given situation and generating multiple options; would rarely feel a "problem is solved", rather would enjoy going back to generate new solutions and improve the problem further; is not content with standard solutions to a problem but rather prefers new and novel frames of reference; sees each idea as merely a stepping stone to additional ideas. In contrast, a person with a high "tendency to make premature critical evaluations of ideas" (low "preference for deferring convergence", or high "preference for quick convergence") is someone who has a high need to be decisive, dislikes wasting time with apparently non-productive trains of thought, is quick to find the flaw in an idea or point of view and eliminate it from consideration quickly; feels each idea ought to be evaluated sequentially, before proceeding to the next one; tends to not want to risk making a mistake; believes there is one "best way" or one "right answer" to solve a problem; has a low tolerance for ambiguity; and prefers to optimize rather than satisfice. These are the two basic attitude concepts identified by Basadur and Finkbeiner (1985) which need to be improved for creative problem solving on the job to improve. The "preference for ideation" is viewed as more of an active concept of idea generation. The low "tendency for premature critical evaluations of ideas" is more of a passive concept, a latitude to tolerate new ideas.

There are three major premises underlying training based on the above foundations. First, for most people, the ideation step is more difficult
than the evaluation step of the ideation-evaluation process. Our society, general training and school systems tend to reward and hone our evaluation capabilities and preferences and promote their use virtually to the exclusion of ideation (Thurstone, 1950; Wallach, 1971; MacKinnon, 1962, 1977; Osborn, 1963). Over a period of time, evaluation starts to dominate. For example, some research has shown that engineering students upon graduation are less able to use their imaginations than when they entered, four years earlier (Altemeyer, 1966; Doktor, 1970). Many organizations want to find ways to increase idea generation and strategic thinking by their managers and engineers. They are believed to be overly "efficiency minded", achieving excellence in performing their routine work assignments daily. However this same tough minded orientation toward optimizing the day-to-day routine tends to work against attempts to also be "adaptability-minded", that is, using creativity to develop new routines, anticipate new opportunities and find new problems (opportunistic surveillance) (Simon, 1960), and solve old persistent problems in new ways. As mentioned above, such efficiency-minded people tend to regard such activity as less important than using their strong analytical skills as they attempt to ensure that the current approach to production is as near to perfect as possible (Leavit, 1975; Simon, 1960; Kolb, 1976). Second, even within the above context, there are individual differences. People differ in their relative preferences, aptitudes, and/or abilities in the two steps of the ideation-evaluation process (Guilford, 1967). Some people may be relatively better in ideation or evaluation. Third, while the training is designed to strengthen both steps of the ideation-evaluation process, it is expected to
have the most effect on that step of the ideation-evaluation process that is
least developed in each trainee.

The whole three-stage process model is schematically describable as shown in Fig. 2. Thus, when reference is made to a "complete process of
creative problem solving," what is meant is this three-stage process
emphasizing the ideation-evaluation principle at each of the three stages in
turn: problem finding, problem solving, and solution implementation. The
training is based upon this model of oscillating ideation-evaluation. Thus,
the notion is that it is not sufficient to merely "solve" a problem
creatively. Creativity must also be applied to the implementation of a
solution and to the discovery of the problem in the first place. In other
words, nothing creative has happened until something "gets done" and also
you have got to "start somewhere"; that is, create the problem to be solved.

In practice, the three stages are reshaped into a circular eight-step
process (Fig. 3). The process must be "learned by doing" and therefore the
training is experiential. The training is accomplished by a series of
diverse tasks and then direct application to real world problems. The 24
hours of training (3 days) are intensive and primarily experiential.
Briefly, training experiences include a series of diverse tasks which permit
and encourage participants to attempt to discover concepts not considered
before, such as ideation-evaluation (see below) and the value of divergence
in thinking. For example, participants individually define a problem from a
case and then compare definitions with other participants, discovering that
the sample problem could then be viewed in many different, yet fruitful,
ways. Another important aspect of the learning by doing emphasis is that
Figure 2

THE COMPLETE PROCESS OF CREATIVE PROBLEM SOLVING
the teachings and emerging skills are also applied to real-world work problems in addition to case studies. For example, each person generates an individual work problem and then develops a solution and implementation plan before leaving the training session. These processes encourage transference of creativity concepts to personal frames of reference.

A great proportion of the training time is devoted to developing the two attitudes of preference for active divergence (ideation) and preference for deferring convergence (low tendency to make premature critical evaluations of ideas). A supportive workshop climate is developed and participants are encouraged and rewarded for displaying these attitudes and in individual problem solving work. Trainees are provided many opportunities for discovery that such cognitive skills do work and in all three stages of the process to further improve the two related attitudes to further induce practice of the skills.

One of the powerful aspects of this Complete Process of Creative Problem Solving is that it is a simple tool that can be tailored for different business needs. For example, in the Research and Development community, it has been used to generate new ideas. Quality Assurance has utilized it to identify barriers to improve productivity and to help identify loss points within the system. Manufacturing organizations use it to find new ideas for cost reduction, to find what barriers are stopping them from improving productivity and quality and for finding ways to get more employee involvement in problem finding, solution finding and solution implementation.
Besides its flexibility, several other aspects of this Complete Process of Creative Problem Solving help make it a powerful and successful intervention. One is the use of deferral of judgment. The deferral of judgment principle allows divergent or ideational thinking by holding evaluation and convergence until a later point. This process of managing one's judgment and desire for closure encourages the development of different points of view and different perspectives, which is crucial to the success of non-programmed problem solving. This characteristic also makes it safe for multifunctional participation and problem solving. Team members don't fear advancing fledgling points of view and don't feel they must be constantly "on guard" to protect parochial interests.

Training in the Complete Process of Creative Problem Solving encourages people to explore new territory, to find new ideas and to continually bring new energies to problem solving. New breakthroughs are more likely to occur under this process of different points of view, relaxed supportiveness and increased energy. The process is trained to be used on the job both by individuals and groups in day to day business activities as well as in formal problem solving meetings.

In summary, the use of the Complete Process of Creative Problem Solving and supportive environments result in the kinds of corporate behaviors exhibited by employees who:

- Search for new opportunities and new problems,
- Have a positive attitude that problems can be solved,
- Value interfunctional problem solving activities,
- Rely on different points of view
Appreciate the value of investing time in identifying the "real problem" before searching for solutions, believing that "a problem well stated is half solved."

CORPORATE IMPLEMENTATION AT THE INDIVIDUAL AND GROUP LEVEL

Applying the Complete Process of Creative Problem solving to increase individual and small group creativity is a powerful tool in industry for at least two reasons. First, it can be applied to virtually any situation or function across the corporation. Second, it is an excellent way of getting a great deal more depth out of problem solving than possible by traditional methods. By depth reference is made to breaking through superficiality. For example, often small group members will dig up and share information they might normally "hide" in a competitive business environment. This occurs because of the trust level built up in the group. Also, the tendency of the group members to see the same problem from differing viewpoints brings forward information members were not even consciously aware of as individuals. As a result, more imaginative and risky ideas flow forth. Individuals will share problems with bosses and subordinates to get help and spark new ideas rather than submerge them fearing displaying a weakness.

A trained practitioner can be of great help to any organization in a variety of group creative problem-solving applications. How to design each application opportunity must be approached creatively on its own merits. A thorough consulting diagnosis involving the client(s) and the practitioner is required to develop an appropriate creative meeting plan. The plan includes the selection and the flow of creativity techniques to be used. It
may include meeting prework and usually includes provisions for post meeting action planning and follow-up.

This section of the paper describes some aspects of implementing and consulting in small group creativity. Identified are specific different types of applications which have proved quite successful in moving all kinds of projects ahead. These applications include developing new ideas for patentable products, circumventing process patents held by competitors, meeting test market and national expansion deadlines, and generating marketing ideas and brand strategies.

In consulting with small groups, the pre-consultation period is the key. The client, the person owning the problem, meets with the consultant to plan the creative meeting. (The consultant can be any person trained in the process). The model is used for the planning process, beginning with the first step. Treating the client's request as a "fuzzy situation" allows the consultant to ask fact-finding questions (step 2) and to evolve a problem definition (step 3). Often the final problem definition (meeting objective) turns out to be quite different from the one held by the client originally.

The client and consultant also determine at this time who should participate and where the meeting(s) will be held. Preferably the location will be off-site to remove the participants from familiar surroundings and increase the probability of novel output. Attendees are notified by a letter inviting their participation. The criteria for selecting participants is based on contribution potential and, where appropriate, team building considerations, too. Also desirable is the right blend of
technical knowledge and "blissful ignorance." This blend will allow fresh viewpoints and a certain novel perspective on the problem. The invitation letter always provides a statement of the objective of the meeting, and may also provide some simple imaginative prework to be brought to the meeting. Such prework provides a starting point for ideas, and allows the process of incubation to work on the problem ahead of the meeting time. The pre-meeting period is usually one to three weeks.

Problems worked at application sessions range from R&D to other corporate functions such as engineering, marketing, advertising, and confidential personnel problems. Furthermore, within each function, application opportunities range widely. The marketing and advertising problems may range from complex brand strategy formulation sessions to more simple brand promotion and new brand name idea generation sessions. The personnel problems may range from "how to make our team more effective" to "what to do with a 20-year employee who no longer seems to be productive" or "is no longer seen as fitting in with new and evolving organizational directions and needs." The engineering problems may range from "how to attach the string in the most efficient way to the tampon" to "how to map out a strategy for a staff engineering group to help line engineering groups improve their cost improvement programs."

The complex brand strategy meetings often run two days or more in length and primarily focus on the fact-finding and problem definition steps of the process. They almost always involve representatives of a complete team (e.g., product development, the advertising agency marketing, packaging development, and sales). In strategy formulation work, it is much more
important to determine the best problem definition, that is the questions to be considered, rather than the subsequent solutions and actions (which often appear obvious when the right questions have been determined). Since each functional group has its own insular point of view to contribute, it is vital to get all of these views represented.

The less complex brand promotion and new brand name idea generation meetings often run shorter, about three to six hours. Simple brainstorming is very effective against predetermined specific challenges in small groups of six or seven people. An example of such a challenge would be "how might we entice more New Yorkers to get excited about purchasing Oxydol?" Each small group is asked to pause every 40 minutes or so to evaluate their ideas up to that point and report their best five or so. At the end of the session the "very best" of the best are selected by the participants. An action plan, specifically denoting what the next steps by the client are to be, become a vital non-negotiable portion of every meeting to ensure that action (step 8 of Figure 1) will take place.

Research work on generating new brand names has evolved the following theory and practice. New brand names for products are found to range on a spectrum as follows:

<table>
<thead>
<tr>
<th>&quot;Highly Descriptive&quot;</th>
<th>&quot;Secondary Meaning&quot;</th>
<th>&quot;Nonsense&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Names</td>
<td>Names</td>
<td>Names</td>
</tr>
<tr>
<td>Mellow Yellow (soda)</td>
<td>Escort (car)</td>
<td>Crisco (shortening)</td>
</tr>
<tr>
<td>Head &amp; Shoulders (dandruff shampoo)</td>
<td>Downy (fabric softener)</td>
<td>Prell (shampoo)</td>
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</tbody>
</table>

Simple brainstorming for new brand names has been found to lead to a long list of "highly descriptive" names. Highly descriptive names are
easily imitated by other companies and have been sometimes found wanting in this respect. Imagery techniques are an excellent way of obtaining "secondary meaning" names. For example, imaging various scenes of refreshment might give rise to a "sea coast" analogy concept which might (and did) lead to the brand name "Coast" for a new "refreshment" bar soap.

The third kind, "nonsense" names, are often the ones most highly desired because they are the most difficult to copy by competitive companies. Here a variation of the "forced relationships" technique of idea generation is often highly effective. "Headline" words pertaining to the product's important properties or benefits or qualities (e.g., softness, absorbency, etc.) are listed across the top of news print pages. Participants write in words under each headline which they associate with that quality or benefit. Then participants take two or more columns of these words and start forcing syllables or other parts of words together to form nonsense words. For example:

<table>
<thead>
<tr>
<th>Benefit: Soft</th>
<th>Benefit: Absorb</th>
</tr>
</thead>
<tbody>
<tr>
<td>Associated words:</td>
<td>Soak</td>
</tr>
<tr>
<td>Fluffy</td>
<td>Slurp</td>
</tr>
<tr>
<td>Pillowy</td>
<td>Drain</td>
</tr>
<tr>
<td>Mushy</td>
<td>Inhale</td>
</tr>
<tr>
<td>Gentle etc.</td>
<td>etc.</td>
</tr>
</tbody>
</table>

Forcing pieces of the words above together might produce names such as Sopil, Pip, Sluffy, Pif, Pik, Drillo, Gain, Murain, Slush, etc. Forcing together portions of words like "Crisp" and "Corn" might provide a name for a good-frying (quality one), all-vegetable (quality two) shortening, for example, such as "Crisco." (It probably didn't really happen that way, but it could have!)
A full-time corporate-wide position for at least one person consulting internally in creative processes permits the introduction of applications of small group creativity to manufacturing (e.g., cost improvement, plant modernization, energy conservation, etc.), engineering (new plant and process design), qualitative market research (using plant and process design), qualitative market research (using consumers as participants), systems analysts (how to consult with clients more effectively), R&D matrix team formation, critical path scheduling, and strategic planning from corporate level to project team levels. Also, an increasing demand for training in creative problem solving will develop, largely by word of mouth. For example, some of the sales departments will find such training not only highly pertinent to gaining new business (by more creatively solving customers' problems), but also highly motivational. This leads to training sessions of various durations for new sales employees, seasoned sales veterans, and entire sales districts. As described later in this paper, a fine way to ensure corporate adaptability is to try to have every one in the company capable of serving as a consultant or even training others in the complete process of creative problem solving.

Later, the use of advanced ideation techniques such as imagery, analogies, metaphors and even psychodrama, as well as different kinds of evaluation techniques, such as paired comparison analysis, can be gradually incorporated as sophistication and organizational skill increases.

It is important to get participants of a group problem solving session to internalize the deferral of judgment principle as opposed to a simple understanding of it. The leader can demonstrate that the the deferral of
judgment principle will be enforced (at all times) and no one need fear sharing any thoughts occurring at any time during the session. One way to do this is to model the opposite of this principle by asking the members for an idea then proceeding to destroy it with derogatory remarks. This illustrates the negative effect that premature judgment has on idea flow. As an introduction to the session, it is also helpful to ask participants to partner up with a group member from a different work group and exchange information about the problem. This increases relaxation among the differing departments and increases the tendency to share ideas and thoughts.

CORPORATE IMPLEMENTATION AT THE ORGANIZATIONAL LEVEL

There are three keys to assure the success of the process corporate wide:

1. **Make sure everyone knows the "business need"**
   
   (a) Top management planners calculate and present the business need to the function heads in a "bullet-proof" case for productivity improvement at the very beginning of the process. The function heads need to be part of the planning and tailoring of the overall approach and receive training first.

   (b) At least one high ranking member of management should be present at virtually every training program to share the overall company business need and position the particular local business need.

   (c) Cost and Profit data should be openly shared with employees at all levels. People want to help, but they can’t solve cost and profit problems without the cost and profit facts. Money is saved where money is spent.
(d) Before a training program is designed, an extensive "preconsult" with the leaders of the organizational sub-unit should be conducted to ensure the sub-units appropriate specific business need is addressed.

(e) Corporate Strategy decisions and commitments are openly shared with employees.

(f) Anticipated cost improvements are calculated directly into next year's budget. Successful realization is thus expected.

2. Form interfunctional profit improvement teams to attack specific problems

The idea is to leverage traditional functional performance. This is because the problems of sustaining profit in today's accelerated competitive arena require an interdisciplinary approach. Most times the problems require knowledge about several parts of the business. Furthermore, the best solutions often affect or require the cooperation of other functions (e.g., a Manufacturing idea to reduce cost which causes Sales to have an additional "headache," yet the net result is very positive).

This leveraging of functional performance can be diagrammed as in Figure 4. The Vertical Axis depicts the degree of Vertical Leadership performance. This means performance within one's function on functional problems. Such performance is largely individual in nature, meets function goals and relies on the hierarchy to get things done.

The Horizontal Axis depicts the degree of Horizontal Leadership performance. It means performance across as many functions as necessary to solve organizational problems. Solutions usually affect more than one
function and may require "sacrifices" by some functions relative to others. Often ingenuity leads to new solutions requiring no sacrifice at all. Such performance is largely team-oriented in nature, meets organizational goals and relies on informal "networking" to get things done rather than hierarchial approval. It involves influencing people by means of the work itself and developing "big picture" understanding. Horizontal leadership emphasizes team play and long term thinking. It discourages "zero-sum" thinking where solutions are limited to analytical compromises akin to bargaining between adversaries.

One example of how the use of the Complete Process of Creative Problem Solving expanded the range of thinking follows. A manufacturing management interfunctional team was concerned with crewing a new process designed to improve the way seasoning was applied to a snack food product. As originally perceived, the problem was "how might we crew the new seasoning loop?" With further fact finding and shifting of points of view, the problem was redefined first as "how might we minimize cost and maximize labor when crewing the loop?", and finally sharpened to "how might we obtain 'crew buy-in' for how we crew the new seasoning loop?" Several good ideas were generated and an action plan developed as soon as this new problem definition was recognized. For most teams, the problem sensing and redefinition process is the most powerful aspect of the Complete Process of Creative Problem Solving. Investing creative effort in fact finding and in problem definition always pays off in saving time by finding superior solutions which can be implemented more quickly.
Figure 4

LEVERAGING FUNCTIONAL PERFORMANCE

<table>
<thead>
<tr>
<th>VERTICAL LEADERSHIP</th>
<th>Vertical Leadership Only</th>
<th>The Ideal: Both High Vertical and High Horizontal Leadership</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Some of Both</td>
<td></td>
</tr>
<tr>
<td></td>
<td>X</td>
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<tr>
<td>Low</td>
<td>X</td>
<td>Horizontal Leadership Only</td>
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HORIZONTAL LEADERSHIP
When formal interfunctional teams are formed, their mission must be carefully defined in a preconsult with key managers. An example of the mission statement emerging from a Headquarters Packaging Team preconsult and the next step follows.

a. **Mission of the Team**

To increase value to the consumer by:

1) reducing packaging cost per pound of product while maintaining quality and/or

2) increasing packaging benefit (quality) while maintaining cost per pound of product.

b. **Preconsult with each team member as a first step**

- position the approach
- obtain input and finalize design
- share mission and get "buy-in"
- provide an "inkling" of the training
- assign pre-work

c. **Design and execute a 3 day training workshop in** the complete process of creative problem solving (See #3 below).

d. **Hold regular monthly meetings using the complete process of creative problem solving** to identify opportunities for improvement and develop action plans for the best opportunities.

One team member is designated "prime mover" for each project thus developed. The prime mover reports progress at each meeting. The other team members serve as helpers to each prime mover in turn using the complete process of creative problem solving to find solutions to any roadblocks.
encountered since the last meeting. Thus, what transpires is a series of "mini-problem solving" sessions. Further training in the form of the leadership workshop (see below) should be provided about 3 months after the initial basic training. The leadership workshop develops important skills in participating in this "mini-sessions" more efficiently. The basics of a meeting then are:

. Each prime mover sends out his/her progress notes prior to the meeting to all team members.
. Each prime mover reviews status, issues and next steps including the type of support needed and potential problem areas.
. Team members must review the progress notes prior to the meeting.
. To ensure that all potential weaknesses in each project are identified and planned for, the prime mover and other team members review the implementation plans step by step. For example, what do we know or don’t know (concerns and what can go wrong) from the raw ingredients step through to the shelf by supplier, convertor and plant.
. Contingency plans must be developed using the creative process around the potential risk areas to minimize the negative economic or developmental impact.
. Each prime mover distributes minutes and action plans for their project to all participants.

3. Provide training in the "Complete Process of Creative Problem Solving" and how to manage the organizational factors to make the training "stick"
(a) help organizational members understand the business need and the adaptability concept
(b) give teams the right tools and attitudes to perform creatively
(c) provide expertise in the thinking skills and attitudes to help members find and solve tough, important problems
(d) train higher management how to nurture adaptability and horizontal leadership performance via structural methods

IMPLEMENTING TRAINING IN A "COMPLETE PROCESS OF CREATIVE PROBLEM SOLVING" TO GET THE THINKING SKILLS NEEDED

The creative process trained is research and experience based. Training is provided at succeedingly deeper levels through a variety of skill building workshops for different purposes. There are four different training workshops and others should be created as organizational adaptability skills mature and new needs and opportunities are discovered.

The four training workshops are

(a) Basic Training
(b) Leadership Training
(c) Team Training (abbreviated and tied to the Leadership Training above)
(d) Train Trainers Certification Process

Information about each of these five training workshops follows.

(a) **Basic Training (3 Day Workshop)**

The "Complete Process of Creative Problem Solving" is a research based approach to increasing the skills required of people working in an organization dedicated to profit team management. It is a way of making
profit team management concepts "come alive" in a practical and enjoyable way of learning.

The process is an organized approach to developing creativity to its full potential. It emphasizes discovering opportunities for improvement in the company's products and procedures and creating, planning and implementing new, novel and practical solutions for all functions of the company from basic R&D to manufacturing and sales.

Success in using the process skillfully depends on learning it at both the intellectual and intuitive levels. For this reason, the learning is accomplished largely by application of concepts and tools to the learner's own real work problems. Team members leave the workshop having already applied the tools and having experienced success on important challenges in which he or she is involved in the job.

Here are some of the objectives of this workshop:

1. **Increased awareness and understanding of creativity** and its relationship to company effectiveness, profit team management and desired business results.

2. **Develop a more creative attitude.** For example:
   - increased curiosity and sensitivity to problems and opportunities for improvement
   - increased awareness of one's own creative potential
   - more openness to other's ideas
   - more tolerance for ambiguity and unstructured problems
   - increased desire to initiate new ideas and commitment to act on them
   - viewing change as source of opportunity
3. Develop ability to apply the process both individually and in work needing interaction with others.

4. Develop the motivation and enthusiasm to impart and share the above learnings with others back on the job.

(b) Leadership Training (3 Day Workshop)

The purpose of the Leadership Workshop is to train skills in leading a small group or a team through the "Complete Process of Creative Problem Solving" to initiate, manage and complete new projects for cost and profit improvement. Attendees have already completed the basic workshop as a prerequisite.

More broadly, these leadership skills are intended for increasing the ongoing effectiveness and productivity of natural work groups, cross-functional teams and the entire organization. The "Complete Process of Creative Problem Solving" is a Creative Leadership process. It is a way of managing people to cultivate the fuller use of their potential day to day in all three areas: adaptability, flexibility and efficiency. It is a leadership process for making these productivity management concepts "come alive" in a practical, applied and enjoyable way.

Creative problem solving leadership is a skilled approach to helping people and teams of people discover opportunities for improvement, and create and implement practical and novel ideas for improving the company in all functions from manufacturing, distribution, and sales to basic research and development.
The training for creative problem solving leadership skill is virtually entirely on a "learning by doing" basis. Participants practice leading small groups of fellow participants in solving real work problems.

(c) Team Training

The objective is to equip non-management employees who work in teams in a short training session with a sufficient understanding of (1) the "reason for being" of the productivity "program" (2) the ideation-evaluation two step thinking process (and other basic principles of creative thinking) and (3) the whole creative problem solving process to assure excellent ongoing work team creative problem solving performance under the leadership of their manager who will have already been trained to lead teams via the Basic and Leadership Workshops.

(d) Train Trainers Certification Process

There is a formal and extensive certification process for training inhouse trainers to conduct Creative Problem Solving training and consultation in their home locations. This process includes building proficiency in using the eight-step process on the individuals' own problems on the job and in consulting with clients and leading work group application sessions on other people's problems. It also involves extensive cotraining and coaching from certified master trainers. There is an intensive six day "train trainer" workshop which accelerates the certification process. As the major outcome of this workshop, trainer candidates must make an action plan for how they will complete their certification requirements back on the job.
GETTING THE PROCESS STARTED AND MANAGING IT

Following are the steps to get a successful adaptability process underway:

- Preconsultation to determine business need and natural integration into the organization. This preconsultation is between the trainers, the top managers of the organization. An "effort contract" is developed as shown in Figure 5.
- Design basic training and positioning.
- Execute the initial training and manage the growth process as a systems approach, not as a "one shot" training program.
- Develop structural "anchors" for adaptability.

Structural anchors for adaptability involve the concepts of "push" and "pull" for organizational growth and change. Training these new skills into individuals and teams for integration into the work place is the "push" side of the approach. This must be complemented with a "pull" strategy to increase "Stickability" by using structural/organizational events and processes to encourage individuals and teams to use the new skills ongoing on the job. Some examples of structural anchors include:

1. establishing a "Productivity Board" of top managers to interact with teams and individuals to help new projects blossom;
2. establishing headquarters interfunctional teams around problems and opportunities which don't relate directly to any single function;
3. setting productivity goals within functions;
4. developing performance indicators for tracking team progress;
(5) setting up regularly scheduled problem solving events designed to meet the Performance Indicator Game Plan Goals (review progress, identify and solve problems) and to hone and maintain individuals' creative problem solving and consulting skills.

In regularly scheduled problem solving events, any whole organizational unit (a department, or a plant, or a multifunctional team) meets at prescribed intervals. Structured creative problem solving application sessions are led "round the clock" by trained leaders to accelerate current productivity improvement projects and find new ones. Action plans are made and reported and progress is tracked, measured and reported to higher management. The event would likely take two days and for best results be held "on site." Problems would be solved "on the spot" rather than "in the abstract." Especially in manufacturing plants, being on site is extremely beneficial. Fact finding can be tangible and ongoing. Good performers in such a session must have a high tolerance for ambiguity and frustration and a willingness to avoid jumping to conclusions about the best solution or problem definition. When the problems are carefully and painstakingly defined via the process, the action plans are usually excellent and strong commitment is built. In summary, a regularly scheduled problem solving event involves:

- Any whole Unit
- 1-2 days meeting
- "Round the clock" problem solving
- Action plans
- On Site
EFFORT CONTRACT

ORGANIZATION: ________________________________

I. SPECIFIC OUTCOMES OF EFFORT EXPECTED:

II. THE SPECIFIC BUSINESS NEED SERVED BY THIS EFFORT IN THIS ORGANIZATION:

III. HOW THIS WORK WILL HELP ACHIEVE THIS ORGANIZATION'S OVERALL STRATEGY:

IV. WHAT SPECIFIC WORK WILL BE DONE:

V. WHAT WILL BE DONE TO ENSURE STICKABILITY LONG TERM:
Ambiguity tolerance pays off

Performance indicator tracking is needed to answer the question "How will we know how well we are doing?" A tracking mechanism is needed that links activities (new behaviors) and results and pulls more good activities due to having clear targets to shoot at and getting concrete feedback easily. There is a specific structural approach to facilitate tracking called "Performance Indicators." Examples of a manufacturing performance indicator include % Yield and % Scrap. Principles guiding performance indicator development include:

- "Money is saved where money is spent". Concentrate on major opportunities. Use Pareto's Law in selecting indicators.
- Performance indicators must be free of dollar figures to factor out inflationary effects.
- A "Master" Game Plan co-ordinating major projects affecting the indicator should be posted.
- Members go back to flesh out "individual" performance indicator Game Plans for each project.
- There may be several Game Plans because of several Performance Indicators selected.

Figure 6 provides a schematic of how the Complete Process of Creative Problem Solving provides the means for implementing the adaptability process.

CONCLUSION

In summary, the complexities of managing a successful business in the 1980's and beyond are increasing. National markets are now international
markets. Regional competitors are being merged to form national competitors. Inflation wanes and waxes but never disappears. Consumers demand more value and will so continue. Planned productivity and the employment of minds as well as bodies may have been optional in the past... it's mandatory today. The process provides a method of aligning business need, teamwork and creative problem solving to improve key business results and at the same time, deepen and strengthen the partnership between a company and its employees. The development of increased adaptability will no doubt dictate the survival and continued profitability of many a well-known firm over the years ahead.
Figure 6

PERFORMANCE INDICATORS INTEGRATED INTO THE COMPLETE PROCESS OF CREATIVE PROBLEM SOLVING

MANUFACTURING EXAMPLE

1. Problem Finding
   - The problem is cost improvement

2. Fact Finding
   - Identify the key areas of cost and appropriate performance indicators

3. Problem Definition
   - How might we improve results for each performance indicator

4. Idea Finding
   - List possible project ideas for each performance indicators

5. Evaluate & Select
   - Evaluate and select best projects

6. Plan
   - Schedule selected projects for the next year
   - Predict timing and impact of each project
   - Be specific ("who, what, where, when, how")
   - Plot performance indicator game plans
   - Set goals in performance indicator areas

7. Gain Acceptance
   - Gain commitment for the plan, including resource allocation and budget
   - Build budget based on performance indicator goals

8. Action
   - Execute the performance indicator game plans
   - Track process against the game plans to achieve the performance indicator goals
   - Meet the goals

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