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Accepting Change: The Death of Old Ideas

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The recent peace negotiations between the Arabs and Israelis facilitated by the United States are a clear example of how difficult it is to accomplish change. As value methodology facilitators, we empathize with world leaders who struggle to solve difficult problems of achieving a permanent peace in the Middle East. Achieving peace requires hard-to-accept change—paradigm shifts—for all stakeholders.

In value studies we develop alternatives for stakeholders to consider—changes in the way things are done now. We apply the best tools we have to encourage the fair and objective evaluation of alternative ideas. We often fail to state our case convincingly, and ideas for change that we believe will benefit the stakeholders are rejected.

Why are well-developed alternatives for change so hard to sell? One reason is that we may focus so hard on the rational aspects of an idea that we fail to address the emotional aspects. The words of novelist John Steinbeck are illuminating: “The words are meaningless except in terms of feeling. Does anyone act as the result of thought or does feeling stimulate action and sometimes thought implement it?” If it is true that feelings about ideas stimulate action before thoughts can implement them, then we need to understand how the feelings of stakeholders may stand in the way of the implementation of VM alternatives.

If the stakeholders’ current way must yield to an alternative way—as proposed in a value study—then we can understand that the old way must “die” for the alternative way to breathe new life. Therefore, it is the grief over the “death” of old ideas that must be allowed to happen; the feelings attached to the old way must be dealt with to facilitate the acceptance and implementation of the new way.

There is a model we can use to understand the feelings associated with the death of ideas. Elisabeth Kubler-Ross, M.D., in her pioneering work, identifies the five stages in the process of coping with death—in how we humans deal with loss. They are: denial, anger, bargaining, depression, and acceptance.

Applying Kubler-Ross’ stages of coping with loss to the loss of old ideas in the value methodology, we can better understand the stages of growth needed on the part of stakeholders to fully appreciate and accept the VM alternatives:

- **Denial** is the first stage in dealing with death or loss; it is dominated by disbelief. Stakeholders easily can hide behind denial—“it can’t possibly be changed”—failing to reach beyond this feeling and apply reason to the VM alternative. We need to understand this as a normal first reaction and allow time for this stage to pass, thus avoiding a hasty rejection.
- **Anger**, the release of emotions, is the second stage following denial. Stakeholders may express their anger with strong words, targeting the value team. Again, understanding this as a normal response and giving time for the negative feelings to be acted out allows the full process to unfold.
- **Bargaining** is the third stage, where the stakeholders have gotten past denial and anger and seek ways around the alternative by negotiating with the value team. Suggestions of “deals,” such as accepting portions of a VM alternative, should be resisted at this stage as more complete acceptance may be forthcoming later.
- **Depression**, the fourth stage, comes to stakeholders with the prospect of change. This might be compared with “buyer’s regret,” when acceptance—“buy-in”—has been made intellectually but emotional regrets linger and need to be worked out.
- **Acceptance** is the final stage. The stakeholders can finally embrace the value team’s alternatives. Reaching this point may take minutes, hours, or days. Being patient and letting the stakeholders work through the earlier stages brings the rewards of full and final acceptance.

This behavioral model teaches that when stakeholders are presented with new alternatives they need time to go through some or all of these stages to become comfortable with the idea of making a paradigm shift—a commitment to change. Expecting instant acceptance is, therefore, both unwise and unrealistic. This understanding gives us an important tool to help us improve acceptance and implementation of VM alternatives.

In this issue of Value World, Rae Cook shares her vision of value management as she writes about ways to help value team facilitators overcome resistance to VE studies. Other stimulating topics include: the Six Sigma Methodology, the proposal of a Larry Miles Hall of Fame, applying VA to a VE program, and remarks by keynote speakers from the 40th Annual SAVE International Conference. Read with appreciation authors’ efforts to help advance the cause of the value methodology.

REFERENCES

An Untapped Market: Energizing VM Use Via Six Sigma Methodology

Michael J. Cook, Ph.D., CVS

ABSTRACT
Six Sigma focuses on the improvement of quality through the reduction of customer-critical defects. It is applicable to processes, products and procedures. Six Sigma achieves improvements through statistical analysis of the interaction of functions in producing a product or service. Six Sigma can be enhanced by better use of VM techniques such as function analysis.

INTRODUCTION
Six Sigma is the latest methodology sweeping across the business landscape and being adopted by major corporations and institutions. Firms are dedicating hundreds of their employees full time to conduct thousands of Six Sigma project implementations per year, resulting in hundreds of millions of dollars of actual bottom-line annual results from reduced cost and increased revenue. The Six Sigma method is well-defined and audited, so it is highly unlikely that project implementations will deviate from the proven methodology by being supplanted by other existing methodologies. However, there are significant opportunities to improve project implementation by infusing elements of value management. VM practitioners can enhance their business and offerings by adding their skills, knowledge, and techniques to the voluminous Six Sigma project implementations, which are increasingly occurring worldwide.

CHARACTERIZATION OF SIX SIGMA
Six Sigma is a methodology that has its own form of “job plan.” It is applied with discipline and rigor and produces amazing results. This section will characterize the methodology according to the dimensions specified by Cook.¹

What is Six Sigma and why use it? Six Sigma is a structured methodology used in any process, procedure, or transaction that repeats itself. Six Sigma is unique because it is a disciplined methodology that is data-driven, with improvements implemented based on statistical validation, not on guesswork or gut feel.

The methodology was developed by statisticians at Motorola in the 1980s. One of the first companies to embrace Six Sigma was General Electric. This fact should be of significance to value engineers because General Electric also was the company that first used value engineering.

Use of the Six Sigma initiative has grown rapidly in the last five years, as corporations have learned of its power to deliver amazing results. Some of the corporations that have adopted the initiative include: Motorola, General Electric, DuPont, Dow Chemical, Sony, Allied Signal, Lockheed Martin, Polaroid, Kodak, and, more recently, Sun Microsystems and Amazon.com.

The basic premise of Six Sigma is that poor quality costs a company, causing lost sales and lost business opportunities. Improving quality through the reduction of defects leads to greater customer satisfaction, and hence increased revenue.

The success of Six Sigma is due to three major points: there is always top-down commitment and involvement of the organization; it’s a proven methodology with tools based on total quality management; and the method is data-driven using statistical techniques.

Sigma as a statistical measurement. The term “sigma” refers to a measure of variation. Specifically, sigma is a statistical measurement of the capability of a process, procedure, or product to meet customer requirements.

Every process, procedure, or product has an opportunity to be executed correctly. Any opportunity that does not meet customer requirements is called a “defect.” If there are a million opportunities to do something correctly and 99.99966 percent of these opportunities are defect-free, then the process is said to be at a “6 sigma” level. Figure 1 shows different sigma levels according to defect occurrences.

<table>
<thead>
<tr>
<th>Sigma Level</th>
<th>Defects per Million</th>
<th>Opportunities</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 sigma</td>
<td>3.4</td>
<td>(99,9966% good)</td>
</tr>
<tr>
<td>5 sigma</td>
<td>233</td>
<td>(99.98% good)</td>
</tr>
<tr>
<td>4 sigma</td>
<td>6,210</td>
<td>(99.4% good)</td>
</tr>
<tr>
<td>3 sigma</td>
<td>66,807</td>
<td>(93.3% good)</td>
</tr>
<tr>
<td>2 sigma</td>
<td>308,537</td>
<td>(69.1% good)</td>
</tr>
<tr>
<td>1 sigma</td>
<td>690,000</td>
<td>(31% good)</td>
</tr>
</tbody>
</table>

As an example, if you examined a million drug prescriptions that were filled and found that 99.4 percent of them were correctly filled (6,210 were wrong), the “prescription filling process” would be operating at a 4 sigma level. If 99.99966 percent were correctly filled (3.4 were wrong), the process would be at 6 sigma.

Customer satisfaction is usually quantified in terms of a target and limits. For example, the temperature inside a restaurant might influence customer satisfaction. The target temperature might be 72 degrees Fahrenheit with upper and lower limits of 75 degrees and 70 degrees, respectively. Every time the temperature deviates outside these limits, a customer might be dissatisfied, resulting in a defect.

1. ValueWorld
Focus of Six Sigma. The Six Sigma Methodology is applied in the context of a project. There are two types of projects:

- Process-type projects deal with the conversion of raw materials into a finished product. Obvious examples are consumer products such as cars, televisions, and paint; other examples include buildings, roads, and structures.
- Transactional-type projects deal with service activities involving paper, scheduling, people, work processes, etc. Examples are inventory management, invoicing, and delivery.

Companies using Six Sigma apply the methodology with success to both types of projects. Figure 2 shows a list of objectives of a cross-section of Six Sigma projects a company might pursue.

In order for a project to be viable for Six Sigma implementation, it must satisfy several criteria. Each company standardizes on these project criteria. However, a typical set of criteria might be: defects are reduced by 70 percent; bottom-line savings or revenue from the project must be some corporate-established amount per year; and the project duration (from its initial definition until a controlled solution is implemented) is no more than, for example, five months.

People involvement. As mentioned, a key success factor for a companywide Six Sigma initiative is top-down commitment and complete organizational involvement. Typically, the CEO is the driver for the entire initiative, and many employees in the company are involved in project implementations. In some companies, all employees have a portion of their compensation placed at risk based on the company’s performance in meeting its Six Sigma goals.

Within a company, a Six Sigma organization is established with specific roles and responsibilities for its members. Each organization has a “champion” whose job is to define projects and remove barriers to successful project implementation. Reporting to the champion is a “master black belt” whose full-time job is to train the organization, assist the champion in defining projects, conduct one or two projects of his or her own each year, and mentor project leaders (known as “black belts” and “green belts”). Black belts are assigned full time to the Six Sigma initiative and typically lead several projects per year. Green belts are assigned part-time and typically lead one or two small projects.

The mode of involvement for a black/green belt is more along the line of a traditional consultant role where a person does most if not all of the work by him- or herself, with slight assistance from a team. This mode is different from the role of a VE consultant who facilitates and coaches the study team to discover winning solutions. Figure 3 shows that the black/green belt’s mode of work swings away from the VE consultant’s mode.

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The Six Sigma “Job Plan.” The Six Sigma “job plan” consists of five phases: Define, Measure, Analyze, Improve, and Control. Typically each phase takes about one month to execute, for a total project execution of approximately five months. A black/green belt conducts all of these phases with occasional input or assistance from a team.

At the macro level, each of these phases answers the following questions:

- Define: What is important to the customer?
- Measure: What is our current performance vs. what is important to the customer?
- Analyze: What causes variations from the target for the customer?
- Improve: What improvements will place us on target with minimal variation?
- Control: What controls will keep us there?

Each of these phases will be explained in more detail below, using an example project. This example project seeks to improve VE studies. Specifically, the example seeks to improve an item that is critical to a VE customer: the savings rate on VE studies.

The Define Phase. Six Sigma’s first phase defines several key elements: a problem statement, critical-to-quality variables, and defects as perceived by the customer. This phase begins with investigations that are conducted by interview or surveys that seek to answer the following questions:

- Who is my customer? What matters to this customer? What’s the scope of the problem impacting the customer? What defect am I trying to reduce? What’s a realistic goal for defect reduction? What’s the current cost of
defects, and what benefit can be realized by reducing defects?

The Measure Phase. The second phase includes information review and data collection to measure (baseline) how the system currently performs. This phase seeks to characterize and quantify the current process, answering the following key questions: What is the process? How does it function? Which inputs seem to affect the outputs? Is my ability to measure and detect good enough? How is my process doing today?

Each of these questions in the Measure Phase is answered with as much quantifiable information as possible using actual, recordable data from the process. The output of the process is known as the “Y” response. Y measures an attribute that is important to the customer; e.g., delivery time, number of errors, or perhaps construction errors. Y is thus dependent on a set of independent input variables. Each input is known as an “X” variable. The classical mathematical formula for this relationship between the Xs and the Y is expressed as:

\[ Y = f(X_1, X_2, X_3, X_4, \ldots) \]

If one contemplates the relationship between X input variables and the Y response output, Pareto’s Law would suggest that only a few X variables are usually vital, that is, have a significant impact on the Y response.

A major component of the methodology is to determine the “vital few X” variables. By finding these vital Xs, it then becomes possible to find the best values at which to “set” those variables to optimize the Y response. One of the first steps in understanding which Xs might be important is to understand how the process works by creating a process map, often done via a flow diagram. Next a “cause and effect” diagram helps to identify all of the Xs that impact Y. After that, you can start collecting data on X and Y. In the third phase, you analyze the X and Y data to see which Xs actually have statistical correlation and impact on Y.

To demonstrate this relationship of Xs and Y, consider the following Six Sigma project which has as its goal the improvement of the VE process. Assume that what matters to the customer is the percent of savings generated from a VE study. The problem statement might then be, “Improve the savings rate VE studies.” The Y response might then be “percent savings commitment at the end of the VE presentation phase.” Setting a target and limits for that output would be of significance. Querying the customer might reveal that the target is 10 percent, with a lower customer limit of 5 percent, and no constraint on an upper limit of savings. Therefore, a defect occurs whenever the savings rate is less than 5 percent.

In this example, the project scope is considered to include all activities from the beginning of the pre-event preparation through the presentation phase of the VE job plan. So what affects the savings rate, i.e., the Y response? A cause and effect diagram might indicate many X variables that impact Y, i.e., the savings percentage. (Of course, the big question is how much they really impact Y.) That list of Xs is quite long; however, several but not all Xs are listed here, some of which later might be uncovered to be vital:

- Percent of design complete at time of VE study
- Physical layout of the study room
- Number of study days
- Number of people on the study team
- Location of the study
- Use of a F.A.S.T. diagram
- Temperature of the study room
- Years of experience of the facilitator
- Team’s pre-knowledge of VE techniques
- Evaluation technique employed
- Number of wildcards (outsiders) on the team
- Team members’ attitude toward change

In the Measure Phase, the black belt begins identifying which Xs might significantly affect the Y response. Then he/she would start collecting data on the Xs and the Y via actual measurements of VE studies.

Critical to data collection is the ability to take accurate measurements in a manner that can be repeated and reproduced. For example, the X variable called “number of people on the study team” is a measurement that can be taken quite accurately, regardless of who takes the measurement and when it is taken (assuming no one leaves or joins the study mid-stream). However, “team members’ attitudes toward change” is an X variable that impacts the study savings rate, Y—however, it may be difficult to measure this accurately. In this case, it then becomes necessary to design and standardize a valid measurement system.

Since the Six Sigma methodology is data-driven and statistically based, the black belt quickly learns that “if you can’t properly measure it, then you can’t improve it.” This is a key tenet of Six Sigma.

The Analyze Phase. The third phase involves statistical analysis of the data to understand the interrelationship of variables and activities/functions and how they affect quality. The statistical analysis includes a variety of techniques, most significant of which is testing of various hypotheses about the relationships between X and Y variables from different samples of data. The goal of the analysis is to find correlations between the variables, and thereby get closer to identifying which X variables might truly be vital to the Y response.

The Analyze Phase seeks to answer the following questions:

Which X input variables actually affect my Y response (and thus my customer’s critical-to-quality issues)? How much is this effect? Do combinations of variables affect Y? If I change an X input, do I really change the output Y? How many observations do I need to draw conclusions? What level of confidence do I have regarding my conclusions?

Staying with the example of the VE process, a statistical analysis of perhaps dozens of VE studies with multiple observations of many of the different X variables might reveal that several of those X variables seem to have the most impact on Y (i.e., the savings rate). For sake of demonstrating the concept, suppose that the following six X variables appear to be statistically significant:
vital to Y:
1. Number of wildcards on the study team
2. Experience of the facilitator
3. Attitude of the study team toward change
4. Management expectations for results
5. Use of function analysis
6. Technical focus arena of the study

The Improve Phase. The fourth phase involves designed experiments to establish the best way to achieve optimal quality. Specifically, combinations of different settings for X variables are selected, and the output Y is observed for each combination. This might show that some Xs initially thought to be vital to Y actually are not vital. For those Xs that are vital, we learn what the settings are of those Xs that give the best Y response.

Continuing with the same VE example, suppose the scheme of experiments highlighted in Table 1 is tested. Table 1 indicates the different levels (i.e., settings) of the six X variables that are tested. Suppose that every possible combination of the two settings and six variables is tested. This would require a total of $2^6 = 64$ specifically designed VE studies, each study with specified settings of the six X variables. The Y response—that is, the savings rate—would be measured for each of the 64 designed VE study experiments. After all of the experiments are conducted, statistical conclusions could be drawn.

<table>
<thead>
<tr>
<th>X variable</th>
<th>Setting #1</th>
<th>Setting #2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of wildcards on the study team</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Experience of the facilitator</td>
<td>Less than 2 years</td>
<td>More than 6 years</td>
</tr>
<tr>
<td>Attitude of the study team toward change</td>
<td>Negative</td>
<td>Positive</td>
</tr>
<tr>
<td>Management expectations for results</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>Use of function analysis</td>
<td>Random functions only</td>
<td>F.A.S.T. with dimensions</td>
</tr>
<tr>
<td>Technical focus arena of the study</td>
<td>Manufacturing processes</td>
<td>Construction</td>
</tr>
</tbody>
</table>

Suppose that the 64 studies indicate that of the six X variables, there is 95 percent statistical confidence that two of the X variables are not strongly correlated enough to impact the savings rate, Y. Specifically, suppose those two nonvital Xs are: team attitude toward change and technical focus of the study. The best settings for the remaining four X variables that are vital (i.e., strongly correlated to Y) would be evident from the experiments. These settings should be set and maintained at those levels for VE studies in the future to ensure that each future VE savings rate is close to the target of 10 percent, and rarely a “defect” of less than 5 percent savings. As example only, the experiments might indicate that the best settings for those four Xs for future VE studies should be: four wildcards; a facilitator with more than six years; high management expectations; and use of random function analysis only.

The Control Phase. The fifth phase puts in place the controls to maintain quality. This phase seeks to answer the following questions: Once it's discovered how to reduce the defects, which X variables are vital, and what the proper settings are for each X variable in order to get the best Y, how do we keep those Xs from being altered? What controls should be put in place in case those X settings vary from where they should be set?

INJECTING VM USE IN SIX SIGMA
Six Sigma is a very structured, disciplined methodology. Corporations and institutions that adopt the initiative will follow the methodology and tool usage quite strictly. This is a critical success factor for Six Sigma.

However, corporations are open to using additional tools to help the black/green belts successfully execute their projects. Certain elements of VM are appropriate for inclusion in Six Sigma.

There are three distinct ways that VM can be injected within the implementation of Six Sigma. The first injection of VM can be in the early position of the entire Six Sigma initiative as a device to help generate appropriate projects/problems on which the Six Sigma methodology might be applied. The second injection can be in the Define Phase to help identify customer-critical defects. The third injection of VM can be in the Improve Phase as a method for creating the design of experiments. Figure 4 indicates these three points of VM's injection into the flow of the Six Sigma approach.

Project Generation. It is often a difficult task to identify projects on which black/green belts should work. Good projects are not always
job plan can be used to help generate viable projects.

In the VM Pre-event Phase, customer critical-to-quality (CTQ) issues would be clarified, since these would serve in the VM study as both a focal point for identifying problems and as criteria to judge ideas generated in the subsequent VM Speculation Phase. The VM study team would consist of customers, contractors, suppliers, wildcards, and process owners/workers.

In the VM study’s Information/Function Phase, the team creates a functional decomposition of their work processes. Work is decomposed down to the level of day-to-day functions that are performed. Then the team identifies which functions are defective—e.g., negatively impact the CTQs, take a long time, cost a great deal to execute. In the Creativity Phase, the team then generates problem ideas—i.e., statements which express the problems that they witness.

In the Judgment Phase, the problem ideas are consolidated into problem groupings to eliminate duplicates and to relate ideas indicating a similar root-cause problem. Then the team scores each problem grouping based on gut-feel against a set of relevant criteria—e.g., how well the grouping satisfies CTQs, reduces cost, etc. Those problem groupings with the highest scores then enter the Development Phase.

The Development Phase may be accomplished outside the VM event. In this phase, problem groupings with the highest score are investigated to assess their likelihood for success as a black/green belt project. This investigation might include checking the availability of data, the potential for meeting or beating the five-month project time frame, etc. A problem grouping that survives the Development Phase as a viable project is then presented to a black/green belt as a project on which to apply the Six Sigma Methodology.

Identification of Defects. During the Define Phase, process mapping via flow diagrams is a typical method used in Six Sigma. However, if a project team developed a function analysis system technique (F.A.S.T.) diagram, and dimensioned the diagram with customer-critical elements such as cost, time, or quality, the team would have an obviously richer understanding of the problem. This would enable the team to better determine the appropriate defect to be reduced, and its corresponding problem statement.

Given this viewpoint, a VM consultant has an opportunity to assist and enhance Six Sigma implementations during a project’s Definition Phase by training project teams to employ F.A.S.T. techniques and/or by actual implementation of F.A.S.T. techniques on Six Sigma projects.

Creating Designed Experiments. As a result of the Analyze Phase, the black/green belt already has completed the statistical analysis of the data. At the beginning of the Improve Phase, he/she seeks to narrow down the list of X variables to a short list of the possible vital Xs. Through a series of “design of experiments,” he/she will uncover not only those vital few Xs but the best settings for those Xs as well.

CONCLUSION

Six Sigma is an improvement methodology, as is value management. There are distinctions in that Six Sigma improvements are more data-driven and statistically validated than VM improvements. Likewise, Six Sigma projects are conducted mostly by one person over a multimonth period, whereas VM studies are conducted by a facilitated team of people over just a few days. Although such distinctions exist, there are strong synergies between the two methodologies.

It is critical that value management practitioners learn more about this significant methodology that currently is being rolled out as a premier initiative in major corporations around the world. The methodology is highly relevant to VM practitioners because Six Sigma provides an entire untapped market for future VM applications. Paying attention to Six Sigma, learning its language, learning how it works, and integrating VM into its implementation will help energize VM usage, strengthen the functioning capability of VM practitioners, and improve the overall success of Six Sigma initiatives.

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Michael J. Cook, Ph.D., CVS, graduated from Michigan State University with an M.S. in Applied Mathematics and in Statistics, and a Ph.D. in Systems Science. In 1985, Cook joined DuPont, where he developed robotic systems and automated inspection systems for their processes. Since 1993, Cook has been in charge of rolling out the Process Simplification/Value Engineering Initiative throughout DuPont. Cook is a certified value specialist and a black belt practitioner in the Six Sigma quality improvement methodology.

Note: This article was originally presented as a paper at the 40th Annual SAVE International Conference in Reno in June 2000.
Overcoming Resistance to VE by Integrating Commitment and Dialogue

Rae Cook, M.A., CTM

ABSTRACT
Resistance in VE sessions is a major barrier to the success of the VE process. The purpose of this paper is to demonstrate that the VE process will take hold if the VE specialist dares to exhibit and use his or her passion and commitment to the VE process and engage the team more deeply. By revealing and sharing commitment to value engineering and by using creative dialogue, the VE specialist can overcome most of the resistance to the VE process and lead the team to dramatically increased participation and creativity.

INTRODUCTION
One of the most frustrating aspects of any facilitator-based process is a hidden one of participant resistance. Consciously or unconsciously, even when success and savings are in the offing, participants may limit their participation, argue unnecessarily with the facilitator, keep emotional and intellectual distance from the VE process, and even sabotage the success of their own projects. Some participants and facilitators blame resistance on lack of “chemistry” on the part of the facilitator or lack of open-mindedness on the part of the participants. Top-level support of the VE process may have only superficial impact on resistance. Bottom line: resistance at the level of facilitators and participants can be handled best by the facilitator.

Facilitators learn a lot about handling resistance. However, much of the literature dealing with resistance focuses on managing the behavior of the “difficult people” among participants. Though this seems like a logical approach, many facilitators who learn these techniques struggle with implementing them. The techniques require a great deal of emotional and verbal self-control. They also require that the facilitator be able to give instant, perceptive, and often psychological evaluations of complex behavior exhibited by participants. Also, a difficult person might add a lot of value to the discussion, so a confident facilitator shouldn’t try to shut that person down. A better solution would be for facilitators to focus on what they can best control and comprehend—their own attitudes and behavior during the VE process.

The purpose of this article is to delineate how the internal state and the verbal and nonverbal communications of facilitators can dramatically enhance how the VE process is perceived and received, leading to less resistance and greater satisfaction for both the VE consultant and the participants. It is not an easy process to become introspective and self-critical, especially when one’s job requires standing for hours in front of potentially critical and resistant groups. However, using a step-by-step approach, consultants can maximize their personal strengths and create an environment conducive to participation, creativity, and openness.

SPHERE OF INFLUENCE
Examining the VE process for the consultants’ sphere of influence is easy. VE stakeholders are clearly identified: corporate executives and other stakeholders, team members, and the facilitator. In terms of influencing these participants, facilitators have varying amounts of control. Despite wishes to the contrary, facilitators’ greatest span of control is in their own behavior: how they wish to come across, the tone they want set for the VE process, how well they listen, and what they communicate verbally or nonverbally. For example, when a team is uncooperative, a facilitator who senses resistance in the room can go to any extreme: become forceful, insisting that the team follow the plan; become withdrawn emotionally from the group; or become indecisive, insecure, or self-doubting. Extremes are not conducive to lessening resistance. Wishful thinking for another team and the desire to leave the entire situation may seem like more natural solutions at these times.

We can become an exaggeration of our worst traits, especially under stress: over-controlling, emotional, self-doubting, tense, self-absorbed, or punitive. Knowing our natural tendencies can limit these reactions to stress and resistance but not eliminate them. Consciously taking responsibility for managing our emotional and psychological sensitivities is a way to turn our influence and self-interest in a positive direction.

Facilitators need to focus on having a conscious impact on the energy and positivity in the room rather than just focusing on a combination of leading the VE process and “surviving” a difficult group. This approach gives the facilitator genuine optimism, energy, and enthusiasm for leading the VE process.

WHY FOCUS ON THE FACILITATORS?
Emotional Self-Control
Besides having the greatest influence and control, facilitators can experience a tough facilitation as an opportunity for emotional growth. For example, facilitators who feel spikes of tension and paralysis of both thinking and leading skills under duress can learn and anticipate what triggers these reactions and how to use thinking ability to calm themselves, thus practicing avoiding what Dr. Daniel Goleman, a neuroscientist, calls “emotional hijacking.” Emotional hijacking occurs when we are frightened or very emotional. Our thinking skills decline because our brains activate only those parts dedicated to tension and to the physical reactions of tension such as rigidity, panic, and sweating;
simultaneously, we fail to use the better paths of the cortical or thinking parts of our brains while emotionally hijacked. Dr. Goleman’s theory is that we can learn to avoid emotional hijacking, but first we have to take full responsibility for handling these emotional moments in a non-hijacked way. Goleman’s theories also hold that this lack of intellectual skill that occurs when we are in an emotional state is seen more in Western cultures than Eastern. In Eastern cultures, how to think while emotional is seen more in Western cultures the theories also hold that this lack of intellectual skill that occurs in emotional moments in a non-hijacked way. Goleman’s theories also hold that this lack of intellectual skill that occurs when we are in an emotional state is seen more in Western cultures than Eastern. In Eastern cultures, how to think while emotional apparently is taught and practiced.

The first step in influencing ourselves is to become conscious of our natural tendencies that let ambiguity and self-doubt stop us from consciously thinking of better ways to influence.

**Most Motivated to Change**

Even though the obvious stakeholders—corporate management and the team—would seem to be logical drivers for change, the facilitator probably is the most driven. Why? Because the facilitator’s future as a consultant with any firm is at stake. This is a very strong motivator. For example, if the team fails, they can blame the consultant or the VE process. The VE facilitator may attempt to blame the team or lack of support by senior management, but this approach could lead to loss of business with that company.

**Facilitators Lead Attitude**

Many facilitators would be surprised to think of themselves as leaders of attitude rather than just process leaders. Although you cannot force others to think the same as you, you can act as a model for how you want them to think, and you can be so clear and persuasive that the team simply emulates you. This behavior is called “symmetry,” and it refers to the well-known fact that groups emulate the leader when the leader is clear and charismatic. Similarly, if the attitude of the leader or facilitator toward VE is apparently positive and open-minded (without being overbearing), then the group will follow suit. When the facilitator evidences doubt in the process, so will the group, by symmetry effect.

Sometimes, leading the attitude of the team may involve some acting, especially when the facilitator needs to reach out to people and be strong even when he or she is naturally shy and inhibited.

**Facilitators and VE Credibility**

The VE process is credible because it has very good surface logic. If facilitators present VE very aggressively or too passively, then the credibility of VE is at stake. Like many service-type products, the “product,” without the participants having experience with it, is hard to imagine. Participants might feel that a process is too difficult to do or that it won’t produce the results described by the consultant. Result: resistance. To enhance credibility, the VE consultant has to demonstrate reasonable belief and enthusiasm for VE both verbally and nonverbally. This does not mean “selling” VE before or during the VE process. It means becoming conscious of how VE facilitators actually feel or think about the VE process and honestly addressing each personal belief before seeing the clients or teams. The goal is to maximize personal belief in VE and to know consciously how you convey your beliefs about VE.

**Facilitators and Future VE Work**

Often clients and teams will request value engineering after using it once because VE produced significant savings and improvements. However, they will request a certain consultant because they believed in and liked him or her. Consequently, future VE projects will result just as much from the credibility and popularity of the consultant as from the savings. The savings part is easy to understand. The popularity of the consultant is a function of the consultant’s effectiveness, attitude, and behavior. The consultant who facilitates well, demonstrates a constructive and supportive attitude, and displays consistently comfortable styles of interaction will be asked back. Plain and simple.

**Facilitators and Communication**

Facilitators believe that they are communicating well when the participants show signs of good comprehension and use of the appropriate steps in the VE process. They’re wrong. Good communication for facilitators includes the ability to hear implied meanings, anticipating the team’s concerns, and managing the room for maximal comfort and focus. Facilitators need to probe—not just VE comprehension, but VE and participant acceptance and comfort.

**TWO KEY INFLUENCE FUNCTIONS FOR FACILITATORS**

The key functions needed for effective influence are commitment and belief in your process, and engaging in deeper dialogue.

**Function 1: Commit to and Believe in Your Process**

VE has many components and techniques. Some, such as F.A.S.T. diagrams, are challenging even to seasoned VE consultants. When VE consultants are afraid of a part of the process or doubt the true value, they risk inability to demonstrate commitment and belief in value engineering in front of the group. Whether distracted by anxiety over the prospect performing poorly in front of the team or the dread of omitting part of the VE process, the VE consultant probably will show a lack of commitment or certainty about VE unconsciously to the team or other stakeholders. The VE consultant with doubts can express them, inhibit them, mask them, or vent about them to VE peers. Better: the VE consultant with doubts needs to confront those doubts and make a conscious decision to work mentally on them.

This is not to say that the only way a VE consultant should approach VE is to embrace every aspect of the VE process with total acceptance. It means that the VE consultant should “take apart” value engineering and explain it to him- or herself in a way that leads to a sense of compatibility and satisfaction with the process instead of complaining or harboring negative feelings or thoughts about even a small part of it.

For integrity’s sake, the consultant should not stand in front of a group, take a week of their time, and engage them in a process that the consultant does not believe in. Complaining to peers, or even the team, or secretly omitting a portion of VE are not satisfying options for the doubting consultant. The consultant needs to consciously examine his or her problems with VE and answer those objections honestly and clearly before working with a group.
Another commitment problem related to working with value engineering is the solitude of the consultant in a facilitator’s role. While a major stakeholder among several, the consultant in most instances is an outsider to the company or the team. Solitude increases potential for self-doubt. When the team struggles with VE, when senior managers don’t show up for presentations, and when team members are resistant or absent, the consultant is the one who experiences the most self-doubt. VE consultants should reinforce their belief in themselves and the VE process in several ways. One way is to keep track of previous successes. Another way is to keep a written record of good things said about the facilitators.

Besides taking responsibility for the role as a committed leader, the VE consultant should consciously monitor his or her wording, tone of voice, facial expression, and body language for signs of commitment and belief in VE. Committed verbal and nonverbal language—relaxed, open, positive, and humble—is focused on the listeners.

If the consultant has either genuinely negative, unresolved feelings about value engineering or, on the other hand, excessively passionate or forceful feelings about it, he or she may need to compartmentalize those feelings for the sake of the VE process and the team. In this situation, the consultant should decide to address his or her feelings in private. The consultant’s goal is to focus on the team rather than him- or herself during the process. The consultant should deliberately put the team in the spotlight as a solution to strong consultant feelings. To focus on the team, the consultant can ask team members what their concerns are, what their needs are, and how they can help each other. This can be done in private or with the group.

Another way to increase personal commitment is to be consciously persuasive throughout the entire facilitation. Whereas most consultants are persuasive during the sales phase, the introduction of the team process, or the presentations to senior executives, they would do better to be consciously persuasive throughout the facilitation. First, they need to identify what is persuasive to a particular group. There are numerous persuaders, which can be divided into those that influence content of speaking or writing (Figure 1, which identifies the top four persuaders for executives) and those based upon the facilitator’s style (Figure 2).

**Figure 2**

Types of Persuaders to Convey Warmth and Authority

1. **Speak in a louder voice with longer vowels and more intonation or up and down movement in your voice.**
2. **Use emotion-based language:** Say, “I’m excited about..., I was pleasantly surprised that..., I found it interesting that....”
3. **Attach a professional value judgment to your facts:** Say, “It’s good that..., It’s critical that we..., This means that..., In our experience this works well....”
4. **Demonstrate energy, commitment, and responsibility:** Say “I’m committed to..., I will take responsibility for..., I’m looking forward to...”; and show positive emotions in your face and body.

**Make VE Accessible**

To feel better about value engineering, VE consultants may exaggerate either the simplicity or the complexity of the process, depending upon their personal needs. If consultants exaggerate the simplicity of the process, they may think that they are making the process more acceptable and irresistible. However, as soon as the team has difficulty with VE, credibility and commitment drop. If they exaggerate the complexity, they add to their self-importance and drive home the point that the client will need a smart consultant to help them. The credibility problem here could be that the client resists starting something complex or thinks that the consultant is too self-serving. Either way, VE credibility and commitment are compromised. Make value engineering user-friendly by being fair about its complexity and about the client’s need for the services. Another valuable consequence of this approach is that the consultant can feel genuinely confident of what he or she is saying and genuinely committed to promises made about VE—neither

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**Figure 1**

Content Types of Persuaders

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>• Provide facts and figures logically</td>
<td>• Think of implications of the proposed change for the unit, department, division, or corporation</td>
<td>• Know and discuss decisions to be made</td>
<td>• Consider regulations and requirements</td>
</tr>
<tr>
<td>• Give meaningful statistics</td>
<td>• Make relevant projections</td>
<td>• Outline next steps</td>
<td>• Be sensitive to limitations</td>
</tr>
<tr>
<td>• Make relevant projections</td>
<td>• Assign value or ranking to information</td>
<td>• Show signs of commitment and energy</td>
<td>• Be able to do more with less</td>
</tr>
<tr>
<td>• Assign value or ranking to information</td>
<td>• Talk about implications of engineering, marketing, finance, manufacturing, QA, IT, customers, suppliers, etc.</td>
<td>• Act decisively</td>
<td>• Ensure nothing is missing</td>
</tr>
<tr>
<td>• “Holistic worry”</td>
<td>• “Holistic worry”</td>
<td>• Make recommendations</td>
<td>• Work within limitations</td>
</tr>
<tr>
<td>• “Holistic worry”</td>
<td>• “Holistic worry”</td>
<td></td>
<td>• Realize potential negative impact</td>
</tr>
<tr>
<td>• “Holistic worry”</td>
<td></td>
<td></td>
<td>• Check the numbers</td>
</tr>
<tr>
<td>• “Holistic worry”</td>
<td></td>
<td></td>
<td>• “Holistic worry”</td>
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**Figure 2**

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overpromising nor underpromising.

**Acknowledge Team Commitment and Constraints**

Another way to enhance commitment to value engineering is to increase awareness and communication about results as quickly as possible in the VE process. Results are reinforcing. Commitment, like many behaviors, continues when it is reinforced. For example, when the consultant and the team commit to working with the process, they need continual reinforcement for their commitment. This can be accomplished by stepping back during the VE process and acknowledging the committed action, positive attitudes, and hard work of the facilitator and the team.

Commitment is compromised when either the facilitator or the team fails to consider and acknowledge the constraints on both of them. In an effort to appear strong and professional, the facilitator may ignore or try to downplay the importance of mutual time pressures, expectations, energy limitations, and other personal and professional pressures. There may be fear that discussing these unspoken constraints will only amplify their importance and lead to the team’s complaining or quitting. Actually, the opposite is true. Unspoken and unacknowledged constraints and pressures rob the facilitator and the team of energy and enthusiasm.

Commitment by the facilitator also can be compromised when the facilitator fails to acknowledge a need to feel important as a consequence of working with VE or with a particularly prestigious client. When managed positively, a need for self-importance is funneled into focusing deeply on the client’s needs, concerns, culture, and belief system and producing great results for the stakeholders. When managed negatively or ignored, self-importance can manifest itself as self-congratulatory speaking or boasting, and cause difficulty focusing on the needs of others.

**Function 2: Have Deeper Interactions**

**Internal Approaches**

To have a deeper dialogue with the team, the facilitator has to choose a deeper goal or mission. Beyond saving money or making processes more efficient, VE consultants should have a bigger, more interpersonal mission as a way to increase emotional and cognitive energy and interpersonal skills. A grander, more interpersonal mission is in guiding the team safely with unflagging optimism, enjoyment, and commitment. Also, facilitators can make themselves and their teams aware of a sincere need for a deeper conversation, trust, and openness. This wide-open process, initiated by and for the facilitator as well as the team, lets everyone know that their contributions are important and that the VE process is about more than cutting costs. It’s about helping each other, learning, and deepening their personal worth to themselves and the organization.

A problem common to facilitators is the desire to have the right answer right away, rather than to wait and listen to the team. In the complete role of consultant, any person is tempted to give the “right answer” as fast as possible, thereby demonstrating competence and intelligence. To have a deeper, more passionate conversation with a team, consultants must inhibit this desire to “show what they know.” Otherwise, in the excitement of having all the answers, consultants remain self-interested and may miss deeper messages coming from the team.

To have a deeper dialogue with the team, the facilitator has to choose a deeper goal or mission. Beyond saving money or making processes more efficient, VE consultants should have a bigger, more interpersonal mission...

The following are other ways to engage in deeper interactions:

**Verbal Approaches**

1. **Ask probing and varied questions.** Again, in a state of self-doubt or when under pressure, consultants are tempted to talk. Too much. Better: Ask varied, provocative, and interesting questions. The most skilled practitioners can ask a variety of provocative questions and wait for good answers patiently. Examples of questions include: What is driving your success? What was the impact on your bottom line? How does that make you feel?

2. **Anticipate and verbalize their concerns.** During the pre-event, don’t just collect project data. Collect people data: Ask what they are worried about, what their constraints are, and what their pressures are. Find out if there are individual problems and concerns, even if they are in the minority. During the process, verbalize their concerns. For example, the consultant can say, “We have a concern in this room about the timing of this VE event. What can we do about that? I am concerned about it.” This open acknowledgment relieves the facilitator of distracting thoughts about negative opinions and concerns in the room. It demonstrates to the team that the facilitator cares, is perceptive, and is courageous. Inhibited feelings in the room inhibit participation and productivity as well.

3. **Listen for implied meanings.** In wording or even tone of voice, team members are telling the facilitator the following: how credible they find VE, what their worries and hopes are, and what changes they need. To build deeper interactions and energy in the room, the facilitator needs to address these signals and say, “Although it’s difficult, it’s useful.”

4. **Test your perceptions.** A drain on the energy and enthusiasm of VE consultants is the fear that they are missing something that is going on in the room or misinterpreting what they perceive. Instead, they should test their perceptions on the team by saying, “I sense that you are getting frustrated with this F.A.S.T. diagramming. Is that right?”

5. **Have genuine curiosity about them.** Experienced consultants...
can use a common approach of quickly diagnosing and dividing the team into types to be dealt with differently. Although this seems logical and effective, its downside is that it can both unnecessarily simplify and distance actual personal relationships with team members. It is better to have a continuous interest in who the individual team members are and stimulate your curiosity about their lives and interests. Ask them general questions such as, “How are you doing?” or “Are you excited about these ideas?”

Nonverbal Approaches
1. **Convey constant openness.** Openness results in high energy, stimulating conversation, and positive mutual feelings. Do more than say that you are open to their ideas. Here is a question consultants need to ask themselves: Am I open to them only insofar as they help me run the VE process? If the answer is yes, then check your motives for higher ones, including openness to them as people with lives outside of your session. Think about your higher goals, such as making a difference in their lives or their work. Demonstrate openness. Stop talking when they talk. Don’t answer their questions in a dismissive way. Use body language—make hand and arm gestures and use eye contact freely to signal openness.

2. **Be a little more flexible.** Listen to what they want or need, and see if you can change yourself or the process to help them with their needs. The process is not more important than the people. The people have knowledge to share, and the team enhances the process. The flexible facilitator can feel recharged by the experience of being flexible.

3. **Monitor facial expression and eye contact.** In the facilitators’ attempts to concentrate and plan during a session, they forget that they are still communicating in front of the team. In this case, they may be communicating a disconnection with the team. Consultants need to monitor their facial expression and eye contact to keep a continual openness, optimism, and involvement.

4. **Monitor tension.** In an effort to please and/or control, a facilitator may become quite tense. To the team this tension looks like uncertainty, doubt, and reluctance to work with them, even though the consultant may intend none of these things. The consultant should take frequent breaks and reduce personal pressure by reminding him- or herself that the focus of the session is on the team members, not the consultant. Tension can be refocused as excitement or enthusiasm. Use emotionally based words and convey with facial expression messages such as, “I’m excited about your ideas.” Play brief games with the team to dispel your tension, as well as giving them a break from the pressure to succeed.

**BOTTOM-LINE POINT**
The consultant and the team’s commitment and energy for the VE process depend a lot on you, the facilitator. Beyond leading the team through a process, the consultant is leading them through an experience with both intellectual and emotional components. When the consultant effectively manages these components, everyone benefits, including the consultant. Besides tangible results such as idea generation, the consultant is capable of creating the realization of intangible results that lead to long-term investment by the team and stakeholders.

**REFERENCES**
4. Ibid.

**Correction**
In the Summer 2000 issue of *Value World*, “Value Methodology: Conferences: Is There a Worldwide Overload?” the Institute of Value Management (Australia) was incorrectly labeled.
Proposal for Larry Miles Hall of Fame

James W. Hudson, CVS, FSAVE

Editor’s Note: Readers interested in responding to the proposal contained in Jim Hudson’s article may contact the editor at the following e-mail address: rog-nan@pacbell.net.

Did Larry Miles play football? Baseball? What about basketball? No, Miles won no recognition in those worthy fields, but he surely was an innovator, or there would have been no VA Job Plan, and that puts him in our all-time Hall of Fame.

A lesser-known Miles characteristic was his marvelous understanding of human nature. He knew that arriving at certain principles which led to a better understanding of a situation was not enough. He spelled out the process and gave it a name. As simple as that may seem, 60 or so years ago it was a crucial step. For one of the powerful—almost magical—aspects of his methodology was giving it a distinctive name: value analysis.

SOME HISTORY

But it isn’t just a “way.” It’s a methodology with a name. Sure, that name wiggled a bit over the years. The U.S. Navy is given credit for calling it value engineering. GSA is best known for being the first to call it value management. But where is it chronicled? It appears in some books, but are they correct? “Who dunnit” is not just a term for detective stories; it is a curiosity we all have—and there is the need for an accurate history.

We are fortunate that General Electric didn’t simply keep Miles’ logical plan under wraps and use it to forge ahead of Westinghouse, Square D, Cutler Hammer, and other competitors of that time. They had a process that had the potential to take a huge leap over the competition. I know. Because in 1960 when I first learned of VE, I was a manager at one of GE’s competitors, the Square D Company. I took the two-week course to learn the methodology and brought it back to Lexington, Kentucky, to see how it worked. We used it to improve our underfloor system, but the real triumph was the way it took our product bus duct from a middle-of-the-road market penetration to one that was head and shoulders above the competition, including GE. In the 1960s, it became the I-Line Bus Duct (and still is today) and soon grew into a whole family of related products. Millions of dollars of profit poured into the coffers of the Square D Company from that design breakthrough.

But the details of that product line is not the subject of this article. What’s important is that the pattern of thought responsible for the product line had a name, and that the name became a means of communication and recognition. Square D wasn’t alone in using the methodology—hundreds of other firms and organizations began giving it consideration. It is the genius of Larry Miles that gave this “commodity” a name, and that has value unto itself.

It took a while, but eventually Miles saw the essential essence of time as it related to the value job plan. In many instances, the cost of the effort and the need for prompt response were vital components in gaining acceptance. In most of our studies and workshops today, we can give the owner a date for reporting the results of a value intervention. It works! They are not interested in an unending research effort—they’re looking for instant results. The time control of a value workshop is a very valuable benefit.

You may ask, “But why are you bringing all this up? Pretty well-known facts, eh?” True, but as great as those concepts were, this is a living, dynamic methodology. We need to change continually. In fact, no other organization has more of a right to expect change than SAVE International, for our entire value concept involves embracing change and finding a better way. For example, we need a repository of facts concerning VM tools and procedures. We need a registry of the history of value management in order to:

• Preserve the chronology of the milestones in the evolution of value, as related to the issues and trends of that day.
• Recognize those who have made significant contributions to the art, science, and application of value.

Value management has international recognition; it warrants an official, accurate chronology. For that reason alone, SAVE International, the value society, should establish the Larry Miles Hall of Fame.

STAKEHOLDER INVOLVEMENT

Consider what already has transpired among our ranks. A variety of procedures have developed to involve various types of “stakeholders.” For example, the Office of Management and Budget of New York City follows a series of steps defined by the value job plan, but it has the clout and budget to involve all of the user agencies in the information, function analysis, creative, analytical, and presentation phases. They often have 30 or more people from various affected departments making their functions known and taking an active part in the VM workshop. Copious, workshop-created graphics line the walls of the large meeting room. In a democratic process, all involved vote for concepts to be developed. Only the development phase is reserved for the value team of design professionals. It is a procedure that works well with a diverse political entity that has been sold on the merits of value management and has the budget to pay for the depth of coverage.

Several presentations have been made at SAVE International conferences relating to this New York City Value Management
Program, but has it been recognized by the society as a milestone in the development of application methods? Can it be readily retrieved by someone searching for methods to involve the stakeholders? What are its limitations? Would it be appropriate for a $5 million project of a much smaller political subdivision, for example, Manchester, Kentucky? Have the individuals instrumental in its inception and maturation been recognized? Are their names inscribed in a permanent record?

ESTEEM VALUE
Those who practice VM have known for decades that one of the inherent characteristics of any study is the esteem value. Cadillac gets an extra $1,000 to $2,000 on every sale for its name and attention to detail that has little or nothing to do with its basic function, move vehicle. To this day everyone knows what you mean when you say "this is the Cadillac."

This is true of our practitioners in value management. Their personal esteem is important. They should earn an accolade for their creative development of VM techniques. How can these innovations be recognized?

One way is to continue publishing their findings in Value World for all members to see. As in a copyright or patent, the first step is a clear definition of the idea, and the second is the date of recognition. A submittal to Value World meets both criteria.

But publication is impersonal. VM practitioners should have the opportunity to tell their story before their peers, receiving deserved applause. Our SAVE International conferences amply provide that opportunity.

Then, at the request of the "inventor" or any other member of SAVE International, the innovative concept will be reviewed by a society standing committee, called the Hall of Fame Committee, and a determination will be made as to its merits. If deemed worthy, an announcement will be made in Value World and at the next SAVE International conference. All inductees in the Larry Miles Hall of Fame will be honored, and descriptions of their invention/innovation will be distributed at the conference.

F.A.S.T. DIAGRAM
Very few of value management's innovations have been widely proclaimed. One of the few is the F.A.S.T. Diagram. Most of us teach and apply the F.A.S.T. diagram by giving a preamble of the way Charles Bytheway conceived of this powerful graphic form of identifying functions, and the way they relate to each other in a complex system. Probably this has been told in hundreds of ways that vary from the truth, but the historic details are not as significant as the fact that Bytheway was acknowledged as the "Father of F.A.S.T." We all desire that kind of recognition by our peers. The Larry Miles Hall of Fame would provide that esteem function.

Such a forum within SAVE International will encourage individuals to improve their own application of the principles of value management, which is good. It will make the society more a part of our professional lives and cause an incentive to retain membership. That is very good, for without a strong society, the value methodology will gradually be distorted, weakened, contaminated, and disappear as a dynamic method of management for the control of quality, cost, and performance.

THE FUTURE
In teaching the value methodology, we often quote from the infamous story of leaders in the 1890s era stating that the U.S. Patent Office was declared a relic because all of the inventions have already taken place. Similarly, we should all realize that VM has a long way to go. The logic will be augmented in the future by better ways of doing the following:

- Use the fantastic storage system of the computer for data and recall during a VM workshop.
- Record the steps taken to reach a new level of understanding and a new conclusion.
- Use the creative talents of individuals coupled with the digitized data of previous studies.
- Include graphics in the information phase.
- Use video presentations for better ways to prove the superiority of our design.
- Persuade decision makers to implement our VM proposals.

We haven't scratched the surface of the sophisticated value methodology of tomorrow. Who will make these discoveries? How can we convince them to reveal their findings so that the entire society and world can benefit from the improvements? Perhaps the Larry Miles Hall of Fame will serve that function.

Those individuals and organizations interested in applying the techniques of value management will have a repository of concepts that they can readily access to assist them in forming their own VM program. The names and addresses of individuals will be linked for further research directly with that person. This will benefit the new user and possibly the Hall of Famer.

I propose that SAVE International, the value society, institute at the next conference a Larry Miles Hall of Fame and encourage all attendees to have as one of their goals in life the induction into that distinguished assembly—and as evidence of that special recognition, wear the coveted ring as proud confirmation of that accomplishment. Millionaire sports figures strive for the honor that goes with their championship ring. Why not the value practitioner?

James Hudson completed his first 80-hour VA training workshop in 1962. He initiated the Value Management Program in Square D Company at their Lexington, Kentucky, plant, where they had great successes in the design of new products and the redesign of existing products and plant processes. In 1970 he formed a consulting firm devoted only to the provision of value services. Most of his early work consisted of assisting the General Services Administration in the formation of their value management program. He was the first instructor teaching value engineering in various cities across the U.S. for the American Institute of Architects and the American Consulting Engineers Council. Hudson has been the principal in Hudson Associates, a VM consulting firm, for 30 years.
Applying Value Analysis to a Value Engineering Program

Ken L. Smith, PE, CVS

INTRODUCTION
The Washington State Department of Transportation (WSDOT) has performed value engineering (VE) studies on transportation projects since 1984. During our more than 15 years of experience with value engineering, we have had large variations in performance. The causes of these variations became an ideal target for process improvement using the value analysis methodology. What better way to prove the value of a process than by applying that process to the program that governs it?

This article documents how a simple seven-point value analysis job plan was applied to the WSDOT VE program. In less than one year, this exercise yielded our organization nearly 150 percent more savings than the total of the previous history of the program. It is highly recommended that any organization with a formal VE program that has grown stagnant duplicate this exercise to improve its VE performance.

VE IN GOVERNMENT
The WSDOT has more than 7,000 employees and an operating budget of more than $3 billion per biennium. Value engineering studies on transportation projects have been performed since 1984. A required progress report is presented to the Federal Highway Administration (FHWA) at the end of each fiscal year (October).

As in any large organization, striving for excellence means doing more with less. Value engineering is a tool that helps accomplish this goal. Many companies gauge the success of their VE program by the dollars saved. In the private sector, dollars saved equate to profits realized. In government we prefer to refer to our successes as cost avoidance. Most VE studies performed on transportation projects are not funded until after the design is complete. The cost avoidance of these projects allows us to program more projects for the same precious tax dollars, thus moving us closer to our goal of doing more with less.

In late 1995, the WSDOT began a quality movement. We trained all of our managers and employees in total quality management (TQM). As we began implementing process improvements and using interdisciplinary teams and tools from TQM, we realized that we were missing out on value by not continuing the value engineering program.

Figure 1 illustrates an increase in the number of studies performed from three in 1989 to 33 in 1991. By 1995, no studies were performed. During this 11-year period (1984–1995), a total of 121 VE studies was completed.

Figure 2 illustrates the value of the approved recommendations as net values, accounting for the costs of the studies and training. The cost avoidance we realized from these 121 studies was just over $15.6 million. That was less than an average of 3 percent of the original project costs. As shown in the chart, the cost of the studies and training actually exceeded the value of the recommendations implemented, resulting in a net loss for the program from 1988 to 1990.

OPPORTUNITIES FOR IMPROVEMENT
There were many reasons that the VE program experienced these variations, but they were not analyzed or documented. Applying the value analysis process to the problem of erratic VE performance unveiled the critical issues and defined the opportunities for improvement.

The following discussion describes the steps we followed to understand the problems and what we did to revive the VE program to produce record years of implementation of VE recommendations.
To gather facts on why our VE program was not as successful as it should have been, we applied the proven VE job plan: Investigation Phase, Speculation Phase, Evaluation Phase, Development Phase, Presentation (Awareness) Phase, Implementation Phase, Audit Phase.

INVESTIGATION PHASE
We began the Investigation Phase by asking the questions: Why was there a decline in VE studies? Why were there low implementation rates? We gathered input from our customers, team leaders, team members, design teams, managers, other state departments of transportation with successful value engineering programs, and certified value specialists (CVS). Then we studied the VE literature.

Most of our problem areas already had been addressed in papers published in the SAVE International Proceedings. The knowledge gained from these papers clearly defined our program as "doing all of the right things wrong."

From reviewing the gathered information, it became obvious that we could categorize the feedback into five functional elements:
1. Management Support
2. Trained Teams
3. Team Composition
4. Final Reports
5. Timing of Studies

Summaries of the results of the Investigation Phase are as follows:

Management Support. We have always had excellent executive management support for VE. In 1995, executive management had hired a CVS consultant to develop a value engineering policy that provided to the regions guidance on the intent and proper use of VE in the department. Unfortunately as of late 1996, this policy had not been distributed to the regions for implementation. An earlier VE policy directive had been implemented by the regions without getting process ownership; understandably, the new directive met with a great deal of resistance.

Since 1994, the department has had five different managers of the VE program. The assignment of VE manager was rotated among employees who already had full-time positions within the headquarters design office, and they were unable to commit to the amount of time required to support a program of this magnitude.

There was poor support for VE at the low- to mid-management levels. Typical feedback comments were:
• "Our design team already performs internal value engineering on every project."
• "I have an excellent design team, so why do I need a group of so-called experts to tell me what we have done wrong?"
• "We have a very competent plan review process."
• "Every VE study we've performed has ended up either costing more or causing us to delay the advertisement date."

Trained Teams. The VE teams sometimes were formed simply out of convenience, not using proper experts and team members trained in value engineering. Experts who have had the training were overused at first and these valuable team members reached "burnout" by carrying full-time workloads and serving on multiple teams.

A database of trained employees exists within WSDOT, sorted by discipline and location. No updates to the database had taken place in several years. Some of the people had retired or moved on, and several of the trained employees had been promoted, so they were not available for VE studies.

Most of the employees trained as team leaders had not led a team for several years or were not available to lead teams today. No employees of the department are CVSs. We do have an on-call consultant agreement contract to use CVSs for team leaders.

Comments from the regions and specialty groups included:
• "I cannot meet my schedules if my best employees are off at some VE study."
• "For every week that I have one of my employees at a VE study I need to bring a consultant on board to cover the workload."
• "I have already paid my dues on VE studies; I am not interested in donating any more of my time to someone else's project."

Team Composition. There is an agreement between the department and our local agencies (cities, counties, and other agencies) that we will donate expertise to their studies and they will participate on ours. We go out of our way to assemble teams that were not involved in the project in any way. The project engineer and design team familiar with the project were not allowed to participate on the VE team.

Final Reports. The team members did not have ownership of the final report as it was often written by the team leader without consensus of the team. The final report often would be delivered several weeks after the study—as much as one year after the study. Late reports often have hindered the implementation of recommendations.

Timing of Studies. Studies were often performed very late in the design/plans preparation stage. Design teams were reluctant to implement recommendations due to potential schedule setbacks and missed promised advertisement dates. The cost of re-design often would offset the cost avoidance of implementing the recommendation. By performing a VE study beyond the 30 percent design stage, the VE team was faced with many constraints that limited their ability to achieve the breakthrough recommendations.

Lessons Learned from the Literature. These WSDOT historical findings from the Investigation Phase were consistent with Theodore Fowler's statement: "Any problem-solving system will identify 5 percent to 10 percent in potential cost savings,... A properly operated VA study typically will identify and implement changes worth 25 percent to 35 percent in potential cost savings." [Fowler 1994]. These are very strong words, but in a nutshell they described the performance of the WSDOT VE program.
Furthermore, we had operated contrary to Fowler’s team rules stating that team members should involve those whose present responsibilities include the project under study; and one team member must be the key person, most commonly the project engineer. [Fowler 1995]. Also, referring to the same author, the team of experts should be responsible for writing the report and presenting the findings. [Fowler 1996]

**SPECULATION AND EVALUATION PHASE**

In the Speculation Phase, 15 ideas were generated to address the problems and opportunities with the WSDOT VE program. These are listed in Table 1, organized by the five functional elements. The Evaluation Phase resulted in judging the 15 ideas for the potential to improve the WSDOT VE program. Table 1 lists the advantages and disadvantages of each idea.

**DEVELOPMENT PHASE**

In the Development Phase, the 10 most promising ideas were developed into specific recommendations to improve the WSDOT value engineering program. They are described below, listed by functional element.

**Management Support**

1. Begin the implementation of the 1995 VE policy by sending a draft to the regional project development engineers. Incorporate their comments to obtain their “buy-in” and adopt

<table>
<thead>
<tr>
<th>Table 1. Creative Ideas and Evaluation of Ideas</th>
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<tbody>
<tr>
<td><strong>Idea</strong></td>
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<tr>
<td>Management Support</td>
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<tr>
<td>Implement 1995 policy</td>
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<tr>
<td>Stabilize the value engineering manager position</td>
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<tr>
<td>Educate mid-managers on the benefits of performing value engineering studies</td>
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<tr>
<td>Have executive management mandate mid-manager use value engineering</td>
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<td>Trained Teams</td>
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<tr>
<td>Sponsor training classes for team members</td>
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<tr>
<td>Sponsor training classes for team leaders</td>
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<tr>
<td>Invite local agencies to training</td>
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<tr>
<td>Team Composition</td>
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<tr>
<td>Use trained team members</td>
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<tr>
<td>Include design team members on studies</td>
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<td>Require project engineer on study</td>
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<tr>
<td>Use consultants on teams</td>
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<tr>
<td>Final Reports</td>
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<tr>
<td>Have team write the report</td>
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<tr>
<td>Give the completed final report to owners on the last day of the study after presentation</td>
</tr>
<tr>
<td>Timing of Studies</td>
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<tr>
<td>Move studies earlier in the design process</td>
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<td>Use the value engineering team to scope the project</td>
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their policy at the statewide project development engineers meeting.

2. Create a VE manager position at the appropriate management level to attract and retain a competent manager.

3. Present the VE principles and educate project development engineers and their assistants at the statewide project development engineers’ meeting.

Trained Teams

4. Step up a number of team member training classes available through the University of Washington’s Transpeed Program and encourage local agencies to attend.

5. Provide a SAVE International Module I training class for at least 16 new team leaders to begin the certification process.

Team Composition

6. Create five- to six-member teams from trained experts with the proper discipline; include the project engineer.

7. Develop an on-call CVS consultant contract to use as required to create expert teams.

Final Reports

8. Have the team, not just the team leader, write the final report, giving it to the owners at the completion of the presentation.

Timing of Studies

9. With the regional VE coordinator, schedule studies prior to the 30 percent project development stage.

10. Develop a pilot program to test and evaluate performing VE on scope projects.

PRESENTATION PHASE

Once a year, all of the project development engineers and their assistants meet in one central location for a conference. These are the managers that have the ultimate say about which projects require a VE study. We used this forum to promote the advantages of value engineering. We also had a work session at this conference to finalize and incorporate the final comments to the draft policy being reviewed. At the end of this session, we adopted the policy, in which “ownership” was given to the engineer group.

Management Support. To further enhance management support, a presentation was made in mid-1997 on the recent success of VE to our transportation commission and executive management. Also, the top 10 VE success stories were put on our Internet homepage.

Trained Teams. Training classes were advertised on our automated training matrix system for employees and local agencies.

Team Composition. The importance of team composition has been included in every presentation and support call to or from the VE manager. It also is included in the adopted VE policy.

Final Reports. An objective for the team at the beginning of each study is to complete the report themselves.

Timing of Studies. The importance of timing of the study has been included in every presentation and support call to or from the VE manager.

IMPLEMENTATION PHASE

The implementation of the recommendations was started in late 1996, as listed below:

Management Support. Began management briefings in the fall of 1996; continuous support will be required.

Trained Teams. Began offering team member training classes in fall 1996, every six months for two years, and once a year thereafter.

Team Composition. Began promoting expert teams in the fall of 1996, continuing for each study thereafter.

Final Reports. Started team-written reports in the winter of 1996–1997; continuous support will be required.

Timing of Studies. Began promoting early studies in the winter of 1996–1997; continuous support will be required.

AUDIT PHASE

The Audit Phase, a continuous evaluation of the VE program improvement recommendations, shows excellent results:

Management Support. All of the recommendations were accepted and implemented as planned.

Trained Teams. More than 100 potential team members, both internal and external, have been trained. Additional team member classes have been set up in the system at approximately six-month intervals. Fifty employees and potential team leaders have completed the SAVE International Module I training workshop, and two have completed Module II. Currently we have 10 to 12 employees actively pursuing a certification in value engineering.

Team Composition. Improvement of the VE teams has been the breakthrough in the program. Since we have implemented the recommendations, we have enjoyed an enormous success in our program. Our completed studies have better than an 80 percent implementation rate. Our cost avoidance has jumped up to 20 percent to 30 percent of the original construction costs.

Final Reports. With the development of a computer program, the team can complete the report and give it to the owners at the final presentation. A technical writer on the study team helps this task. The teams have taken ownership of the reports, and their edits and comments are included as the study progresses.

Timing of Studies. The majority of our studies have been moved up earlier in the project development process. The regions are preparing schedules of projects that are proposed or are in the
“pipeline” to help with the scheduling of studies. The pilot program for performing VE on planning studies has been a success.

Figure 3 illustrates the dramatic improvement in the value engineering program since this analysis was performed. The department has implemented more than 80 percent of the recommendations made by VE teams and has enjoyed more than $60.4 million in cost avoidance to transportation projects. One of the projects studied won the National Association of American State Highway and Transportation Officials (AASHTO) value engineering award in 1997.

CONCLUSION
The successful application of value analysis to a value engineering program proves that the process is not just for projects. Value analysis can be applied to any process, program or project. As long as the job plan is followed and questions of “How?” and “Why?” are asked about the function analysis, the potential for improvement is high.

With the VE program improvement recommendations now implemented, we have realized an enormous improvement in performance. The department has implemented more than 80 percent of the VE study recommendations made, for a net cost avoidance of more than $60.4 million.

Major breakthroughs have came from the use of trained and certified team leaders and from using well-trained key team members.

Several recommendations described here require continuous support by customers and suppliers in all levels of the program. Without this support, the program easily can lose its high level of performance.

REFERENCES

Ken Smith is the VE coordinator for the Washington State Department of Transportation in Olympia.

VM as a Thought Experiment
Roger B Sperling

Vali Sorell, an engineer experiencing his first VM study, became enthusiastic about the process unfolding around him. He began sharing his ideas about the VM job plan; when asked to commit his thoughts to paper, he wrote the following:

- Value engineering is very much a “thought experiment.” A group of designers working together as a team evaluates program concepts, goals, criteria, functions, and design ideas with the goal of making recommendations to improve the value of a given project.

- A large part of the evaluation process involves assigning a rating to each concept. This rating procedure may appear arbitrary or subjective in that no outside resources are consulted, nor is any independent experimentation conducted—only the ideas and experiences of the team members are called on for the rating of each concept.

- Yet the result of following this procedure (the “thought experiment”) extracts recommendations that are then analyzed for cost and design feasibility (the “reality check”). The final product is a highly focused and effective series of recommendations that can yield real and measurable results of reduced cost and improved value.

It is instructive to read the above words; they describe the VM job plan in words a little different from our familiar language, showing that someone outside the VM community can perceive the value of our methodology and help us understand it more clearly. Sorell’s key insight: the evaluation phase has an internal integrity that achieves powerful results because a team of professionals applies their experience to the judgment of alternative ideas.

Vali Sorell, PE, was with JYA Consulting Engineers, Orinda, CA, at the time of the value study.
Challenges to the VE Community

Patsy L. Thomasson is the deputy assistant secretary for the Office of Foreign Building Operations (FBO) at the U.S. Department of State. She was the keynote speaker at the opening session of the 40th Annual SAVE International Conference in Reno, Nevada, and the following highlights were taken from her speech on Monday, June 26, 2000.

In a thought-provoking keynote address at the 40th Annual SAVE International Conference, Patsy Thomasson issued four challenges to the VE community. Her remarks were organized into the following sections: overview of the U.S. State Department’s Foreign Building Operations (FBO) construction program; value engineering in the U.S. federal government; current VE practices at FBO; and challenges for VE practitioners as discovered by FBO.

At the beginning of her talk, Thomasson showed in detail the challenges facing the FBO construction program. The overview continued with pictures and summaries of the current capital projects under construction by FBO.

AGGRESSIVE PROGRAM
In describing an aggressive VE program at FBO, Thomasson displayed a chart, which showed that, on average, FBO accepts 50 percent of the recommended VE savings. Thomasson also announced the award of four VE services indefinite quantity/indefinite delivery contracts to: Pacific Environmental Services Inc.; URS Group Inc.; Project Management Services Inc.; and Hanscomb. And very soon there will be a contract awarded to the SmithGroup.

VE CHALLENGES
In discussing the challenges to the VE community, Thomasson, in large part, drew from her VE experience with FBO:

- **Stop Decline in Federal VE.** After the overview of current projects, Thomasson displayed two charts from the U.S. Office of Management and Budget (OMB) that highlighted the decline in reported VE savings from federal agencies as a whole. The OMB charts also showed a significant drop in Value Engineering Change Proposals (VECP). Thus the first challenge to the VE community—how to stop the decline in VECPs and VE savings in the federal community.
- **Improve Communications.** Her second challenge was to improve communications between the VE practitioners and the project teams and owners. In Thomasson’s FBO experience, she finds that the project managers complain that implementing VE recommendations will delay the delivery of the project. Furthermore, she finds that VE sometimes appears to set up an adversarial attitude between the VE team and the design or owner teams. Her question was: How does value engineering fit in with the partnering process?
- **Apply Value Engineering to Project Delivery.** Another challenge facing the VE community is fitting alternative project delivery systems into the VE process. FBO is experimenting with this, and the results have not been all positive. Thomasson stated that the VE community should answer the following questions in regards to design/build projects: When should VE studies be performed? How should any savings be shared? How should VECP clauses be handled in design/build contracts?
- **Enhance Implementation.** Thomasson’s final challenge to the VE community focused on implementation. She stated that in her experience, most VE teams hand in a great report and walk away. However, once the report “hits” the organization, the implementation problems begin. Project managers worry about the impact of the changes and the timing of both the studies and the recommendations. As the executive of a facility management organization, Thomasson is trying to balance schedule, quality, cost, and scope of her projects. If value engineering can help her reach this balance, then she feels it needs a place at the table. To reach the table, VE practitioners need to show how they can help.

Visions for Value Analysis

Tony Harris, chief deputy director of the California Department of Transportation, was the keynote speaker at the Tuesday, June 27 luncheon session at the 40th Annual SAVE International Conference. Highlights from his speech follow.

Tony Harris spoke at the conference on behalf of the California Department of Transportation (Caltrans) value analysis program, which effects $100 million in implemented savings annually on transportation projects throughout the state. The following are some key points made by Harris during his inspirational, captivating speech:

LESSONS LEARNED
Harris’ first experience with value analysis came during VA training in the early part of his career with the Federal Highway
Administration. Harris strongly feels that the current VA program is making greater impact within Caltrans, compared with a few years ago. Use of VA consultant services has helped the program become stronger. Harris believes that value analysis should be done early in the project development process—and not just once. Project managers should identify and resource VA studies into their project work plans. This is an opportunity to improve projects and should not be treated as just an additional requirement to complete. In addition, VA teams should be involved in the implementation process.

**NEW OPPORTUNITIES**
The Caltrans VA Program has a great opportunity to give projects and processes a fresh, new look because of the following:
- Rapid growth of newer, inexperienced employees
- $3 billion in construction projects this year, with an additional $10 billion in the pipeline
- California's population growth combined with the state government's commitment to fund the transportation system to accommodate this growth, which will continue to tax the existing transportation system

**VISIONS FOR THE VA PROGRAM**
Harris' visions for the Caltrans' VA Program include:
- Increased savings well above the current $100 million in construction savings per year
- Using VA studies to create partnerships, build consensus with transportation partners, and help formulate policy decisions
- Improve VA studies by supplanting inexperienced engineers with a more experienced staff
- Increase resources, including consultant services, to the VA Program

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MY VALUE CAREER

Bruce L. Lenzer, CVS

Not long after attending my first SAVE International conference in 1980, I graduated with a bachelor of science degree from the University of Texas at Dallas. At VEI Inc., I had my first exposure to value engineering and SAVE International. I took my initial training from Art Mudge and began applying the tools and techniques of VE in the petrochemical industry as an employee with Sun Oil Company. Although I did not have direct VE experience, I was successful in using analytical tools and techniques to help project teams apply the decision-making aspects of the value methodology job plan. I continued to study on my own to learn more about value engineering and attended society chapter meetings.

In the mid-1980s the oil boom became a bust. Therefore, I found myself consulting for a couple of years before I accepted a position in the telecommunications industry, where I could apply my information systems knowledge and experience. At Ericsson Telecommunications, I discovered a number of opportunities to apply value creativity to solve a variety of challenges and to assist in making strategic decisions. During this time, I decided to pursue formal CVS certification. I began preaching the value methodology and sold senior management on the idea of applying the value process to other company challenges. I received a modest level of support from management, but not enough to satisfy an ambitious, up-and-coming value professional like myself. I was caught between several reorganizations and lost management support.

Shortly thereafter, I received an employment offer to become part of the greatest scientific project of the 21st century since the Manhattan Project. The Superconducting Super Collider Laboratory, a giant atom smasher 54 miles in circumference, was scheduled for underground construction. The idea was to unlock the secrets of subatomic structures. I continued to apply the value process where there were opportunities; however, there was a lack of senior management support.

I'll never forget boldly asking the general manager of the Super Collider why we weren't using more value engineering to help manage and control baseline costs. He responded that he felt it was too early in the life cycle of the project to use VE tools and techniques. As most of you know, 18 months after this statement was made, the baseline cost of this project increased from approximately $6 billion to $9 billion. A baseline validation report conducted by the Department of Energy revealed that more value engineering was needed to help control cost growth and cost risk on this project.

At this time, laboratory management learned about my involvement with the Dallas-Ft. Worth chapter of SAVE International. Events converged, and my passion for the society and the value discipline paid off. Laboratory management approached me to help conduct one of the largest baseline value engineering studies ever attempted on a government project. I was empowered to mobilize a team of 14 value professionals within a few weeks to conduct 21 value studies on each component of the project baseline. The VE teams successfully identified $200 million in hard dollar savings for three of the 21 studies. However, we were a couple weeks late and $1.3 billion short of achieving a $1.5 billion baseline improvement when Congress decided to cancel the entire project.

Keys to building a value career include the following: having a passion for the value methodology; talking and walking the VM principles; being involved with SAVE International at the chapter and national levels; being prepared to step up to the plate when the professional challenge presents itself.

The power of positive and passionate thinking—and being in the right place when events converge—are important ingredients needed to achieve a rewarding value career.

My value specialist career has not been without its challenges, but I can say it has been very exciting and full of new and interesting projects. And two projects have never been the same. The best part about my value career has been getting to know the many wonderful individuals domestically and internationally who have helped pioneer what SAVE International and the value methodology have become today.

As the president of SAVE International for the 2000/2001 term, I'm excited about the opportunities that lie ahead for improving our organization and nurturing the next generation of value practitioners.
Share the Value

Value World is looking for original articles for upcoming issues. You can also submit reprints or abstracts from other journals or periodicals if you obtain permission from the copyright holder(s). Each issue of Value World will follow a specific theme, featuring articles related to that theme. The deadline for the spring 2001 issue, "Health Care," is November 3, 2000.

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