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Winds of Change

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VALUE WORLD

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Editorial: Winds of Change

Readers will discern a number of format changes in this issue of VALUE WORLD. The intent of the changes is to provide more pages for articles and features.

You will note in the Masthead that I have succeeded Jim Vogl as Editor-in-Chief. Jim is now Editor Emeritus with the responsibility for the overall technical integrity of the journal. Associate Editor Hal Heydt is responsible for interfacing with the Contributing Editors. Associate Editor Del Younker shares the responsibility with me for the production of the Journal.

The Functional and Operational Vice Presidents of the Society are Contributing Editors and are responsible for articles in their respective areas. They will serve as the editors for periodic specialty issues such as last year's Environmental Issue.

There are several interesting articles in this issue. In O. James Vogl, Editor Emeritus, I have the pleasure of relating some of the extensive background that Jim brought to the job of Editor-in-Chief of VALUE WORLD and the SAVE Conference Proceedings.


Larry Zimmerman's article, Role of the SAVE President, is the first in our EXECUTIVE SERIES, which will be a continuing feature in future issues along with RELATED LITERATURE, BOOK REVIEW, and ESSAY.

The article in RELATED LITERATURE is from the PROGRAM MANAGER, the Journal of the Defense Systems Management College. Janice Menler brings out some interesting contractual relationships in Best Value Contracting.

The first entry under BOOK REVIEW is Value: Its Measurement, Design & Management by M. Larry Shillito and David J. DeMarle. This book will make a worthwhile addition to the libraries of value practitioners.

ESSAYS will be the vehicle for Tom King's Thunder and for our Editor Emeritus, Contributing Editors at Large, and others to share their expertise with the readers. Tom's topic in this issue is the intriguing notion of a Czar of Tepid Affairs. I then offer a few thoughts on recycling government waste in Perspective: Sleeping Giants and Hidden Wealth.

The first issue of each successive year will contain an index of articles (and authors) that were published during the previous year. For its debut in this issue, the index covers 1991 and 1992.

Authors need no longer provide photographs with their manuscripts for VALUE WORLD. We want to make the process of contributing articles as easy as possible. Similarly, we will accept manuscripts in hard-copy form as well as on computer diskette. Please follow the INSTRUCTIONS TO AUTHORS on the inside front cover.

We want our readers to have the best possible forum for exchanging information on the state-of-the-art in value engineering and its related disciplines. We invite your comments on the new features and the revised format, just as we welcome your contribution of articles.

A few words about our editing style are in order. We may reorganize the article to improve the logical flow of the narrative, but we do not condense an article without the author's permission. We do, however, attempt to eliminate redundancy.

We only do copy editing, not technical editing, but we do correct obvious technical errors. We change layouts to conserve space. Authors need not provide their biography, only their title and affiliation which we give at the end of articles.

Our turnaround time for publishing an article is two months. For more information, contact us by mail, telephone, or facsimile. We promise you a prompt response.

I thank the Board of Directors of the Society of American Value Engineers for entrusting me with the stewardship of VALUE WORLD. I am grateful for the new horizons and I am looking forward to the challenge.

As Shakespeare said in Twelfth Night: "Some are born great. Others achieve greatness. Still others have greatness thrust upon them."
Jim Vogl donned the mantle of Editor-in-Chief with the April 1981 issue of VALUE WORLD and again in 1982 with the Sixteenth Annual International Conference Proceedings of the Society of American Value Engineers. It is impossible to mention either publication to anyone without invoking his name.

Jim introduced many innovative features in VALUE WORLD and the Proceedings. The professional stature of these publications is due in large measure to his creative leadership. Jim also has to his credit A Compendium of Contested Value Engineering Cases published yearly by the Electronic Industries Association. He is also the author of Encyclopedia of Value Volume II, published by the Society of American Value Engineers.

Jim is now Editor Emeritus of VALUE WORLD with the responsibility for the overall technical quality of the Journal. On occasions, he will contribute some pithy comments from his wise-old owl vantage point.

Jim has served the Society of American Value Engineers in many other ways. He has been the Southwest Regional Vice President, International Vice President, and Executive Vice President. His service was recognized by the Society’s Presidential Citation, and appointment as a Member Emeritus and a Fellow of the Society of American Value Engineers.

The citation and appointments were not the only recognition of Jim’s many contributions and professionalism. He has been appointed a Fellow in the Institute for Advancement of Engineering. He has also been cited for his many contributions as an associate member of the Electronics Industry Association’s Value Management Group. He was at the forefront of promoting the practice of value engineering in this capacity.

Jim’s career started in 1937, when he left at Purdue University to enter the U.S. Army as a Second Lieutenant in the Field Artillery. Following an illustrious Army career in World War II, he joined Hughes Aircraft as a value engineer and the University of California as member of the adjunct faculty. During his return to academia, Jim earned his BA and MA degrees and Adult Teaching Credential from California State University.

Jim advanced to Corporate Manager for Value Engineering at Hughes Aircraft in 1981. Until his retirement in 1983, he was responsible for many hundreds of millions of dollars of value engineering savings.

Under his leadership, Hughes aircraft was one of the first companies to produce value engineering savings for the government. Jim conducted more than 40 value engineering workshops and more than 200 classes on the contractual aspects of value engineering. It is no wonder, that he is listed in such prestigious compendia as Who’s Who in the West, Who’s Who in Finance and Industry, Who’s Who in Aviation, International Who’s Who of Contemporary Achievement, and the Dictionary of International Biography. Jim is equally well-known for his many civic contributions. He has served as a member of the Fine Arts Commission in the City of Torrance and Vice President of the South Bay Community Concert Association.

The October 1993 VALUE WORLD was the last issue published under Jim’s stewardship. Jim intends to publish the 1994 SAVE International Conference Proceedings before donning the mantle of private citizen. Perhaps now he will be able to enjoy his life memberships in the United States Chess Federation, Delta Upsilon, Military Order of World Wars, National Association of Armed Forces, and Retired Officers Association.

As we say in the trade, you’re a tough act to follow Jim. Rarely has anyone given so much to so many as you have. The Society and its members are in your eternal debt. We all wish you good luck and God speed in your new endeavors.

Goodnight and 30.
Using VE to Facilitate Process Waste Assessments

Roger Sperling, CVS

Problem solving is the process of closing gaps by finding missing information, reevaluating what is already known or, in some cases, redefining the problem (1).

INTRODUCTION

The Department of Energy's Process Waste Assessment (PWA) methodology is compared and contrasted with the VE methodology. Both are problem solving processes. While they are similar, there are differences which present an opportunity for VE to facilitate PWAs. Proven techniques used in VE studies can be applied to PWAs, especially in team leader training, team selection and function analysis (2).

PWA METHODOLOGY

The PWA methodology is based on the Environmental Protection Agency’s Manual for Waste Minimization Opportunity Assessment. It is a group-centered process. PWA team members are chosen because of their familiarity with hazardous waste regulations and techniques of waste minimization (3).

The model for PWAs, shown in Figure 1, contains four phases. There are nineteen separate activities in this model. PWAs are best accomplished using a graded approach, with only the largest and most complex processes requiring the full compliment of activities.

VE METHODOLOGY

Value engineering is a methodology for solving problems and reducing costs while maintaining functionality. The VE methodology is a group-centered process, also. A VE team usually is an independent group of professionals with the technical expertise needed for the study project. They can be persons who are familiar with the project, in some cases.

The model for value engineering is the VE Study Plan which is summarized in Figure 1. There are nine phases with nineteen activities shown in this model. The VE Study Plan includes phases unique to VE, such as the "Function" and "Presentation" phases. VE also is best accomplished using a graded approach; formal VE studies using all phases are applied to larger projects.

COMPARISON OF METHODOLOGIES

A direct comparison of the PWA and VE methodologies can be made by examining Figure 1, where the phases and activities of each methodology are listed in parallel. For example the PWA "Organization" phase is almost identical to the VE "Pre-Study" phase; both involve selecting a team, a team leader, and a project or area to study. A key difference is the kind of training the team leaders bring to the team meetings (see Recommendation 1, below). Another is the independence of VE Teams compared to PWA Teams (see Recommendation 2, below).

There are other similarities of the two methodologies. Parts of the PWA "Assessment" and VE "Information" phases are equivalent. However, the PWA "Prioritize Waste Streams" activity is done differently in VE, where "Function Analysis" and "FAST Diagrams" are used. This is the most significant difference between the two methodologies (see Recommendation 3 below).

While both methodologies are designed to solve problems, the VE methodology contains some activities which can be used in PWAs to close the knowledge gap and even redefine the problem, if necessary. Three specific recommendations are delineated below after Figure 1.
Process Waste Assessment

Phase Activity
1. Organization
   • Select PWA Team Leader
   • Select Assessment Areas
2. Assessment
   • Compile Process Data
   • Characterize Waste Streams
   • Visit Process Site
   • Prioritize Waste Streams
3. Development
   • Generate Options
   • Screen Options
   • Technical Evaluation
   • Economic Evaluation
   • Final Ranking
4. Implementation
   • Select Options
   • Final Report
   • Justify Projects
   • Obtain Funding
   • Installation (equipment)
   • Implementation (procedure)
   • Evaluate Performance
   • Successful Operation

Value Engineering

Phase Activity
1. Pre-Study
   • Select VE Team Leader
   • Select Study Project
2. Information
   • Compile Project Documents
   • Interview Design Team
   • Tour Project Site
3. Function
   • Function Analysis
   • FAST Diagram
4. Creative
   • Brainstorm Functions
5. Evaluation
   • Combine/Refine Ideas
   • Rank Ideas
   • Phases/Proposed Concepts
   • Advantages/Disadvantages
   • Initial/Life Cycle Costs
   • Oral Presentation
6. Development
7. Presentation
8. Report
   • Final Written Report
9. Implementation
   • Select Proposals
   • Revise Project Documents
   • Construct Facility
   • Successful Project

Figure 1 Comparison of PWA and VE Methodologies.

RECOMMENDATION 1
TEAM LEADER TRAINING

Provide training experiences for PWA team leaders in team building skills.

VE team leaders receive training in ways to develop teamwork and stimulate creativity, in order to become Certified Value Specialists (CVS). When a CVS examines the PWA methodology, it is easy to identify its group-centered nature and visualize how the PWA team could be guided (facilitated) through the sequences of activities. It is also easy to understand how an untrained PWA team leader could have some difficulty achieving success, especially on an initial assignment. How can PWA team leaders, be better prepared to facilitate PWA teams? To optimize PWA team performance requires that the leader have specific non-technical background.

By providing training in how successful groups work, the PWA team leader can move from being a meeting convener to a team facilitator. Formal facilitator training is one way to achieve this. In addition, there are books that teach techniques of facilitating small groups to reach consensus decisions, and articles which explain the different roles people play in small group meetings and the optimum size of teams (4,5). VE texts discuss creativity and emphasize how the creative potential of teams can be nurtured by facilitators (6).

Following the model of the CVS, PWA team leadership should be invested in certain able, trained individuals. Once a person has learned to be a successful facilitator, the individual should be invited to serve in that role again, rather than arbitrarily assigning new, untrained persons to new PWA teams.
RECOMMENDATION 2
INDEPENDENT FULL-TIME TEAMS

Engage independent full-time PWA teams for larger processes.

A singular benefit of VE studies is the independence of the study teams. Formal VE studies use technical professionals who are not familiar with the process or project and are not even part of the organization sponsoring the study. Some early "scoping" VE studies, such as VE at Scope Time, or VEST, uses design teams to explore the project functions and use creativity to develop optional design approaches. However, formal VE studies work best when they are done by independent consultants (7).

The advantage of independent teams is their ability to not only be objective but to ask "dumb questions." Team members unfettered by the technical culture of the sponsoring organization can question the fundamental assumptions behind the project under study. They can force the owner to reexamine the primary "needs" and, perhaps, discard some of the secondary "wants" which are encumbering the project.

By contrast PWA teams that are drawn from different levels in the organization, and who are familiar with the process under review, may be dependent on that organization and may not have the same freedom to challenge the existing process. This lack of independence can inhibit creativity and limit the range of options sought from PWA.

VE teams are short-term, full-time groups, dedicated to one project. They work, virtually without interruption, on the study project. It may seem a luxury to devote a concentrated effort to one project, but this protocol energizes the team to study and recommend alternatives in a short period of time. This contributes to rapid team building and enthusiastic, high energy performance to meet expectations.

RECOMMENDATION 3
FUNCTION ANALYSIS/FAST DIAGRAMS

Employ Function Analysis on all PWAs. Use FAST Diagrams on larger, more complex processes.

Function analysis is the core VE activity; FAST (Function Analysis System Technique) diagrams are one of the tools used to analyze a project, part or process to ask "Why" and "How" it is to be accomplished. There are a variety of techniques that have evolved to help VE teams perform function analysis. The object is to go to the roots of the system to sort out "wants" from "needs" and eliminate unnecessary functions and cost. Often the problem is completely redefined using functions (8).

Function analysis makes it easier for the team to see where excessive cost may be and to make judgments about the appropriate distribution of costs. Another value of the functional approach to problem solving is that creativity is enlarged when brainstorming is applied to a function rather than an existing item. Brainstorming functions opens the door to more creative ideas.

Function analysis and FAST diagrams can be applied to PWAs without alteration. They are universal problem solving tools that are transferable from VE to PWAs, having the potential to redefine the problem.

SUMMARY

Three recommendations are made for using VE to facilitate PWA. These are: 1) Team leader training to strengthen their skills and to better equipped them to facilitate PWA teams; 2) independent full-time teams to enlarge the range of creative options developed by the PWA methodology; and 3) function analysis and FAST diagrams to deepen the analysis of existing processes and differentiate between primary "needs" and secondary "wants".
Each recommendation can be considered in a graded approach to PWAs, applying those that fit the size and complexity of the process. Using VE to facilitate PWAs can help close the information gaps, re-evaluate what is already known and, in some cases, redefine the problem.

ACKNOWLEDGMENT

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REFERENCES


Mr. Sperling is SAVE National Director of Annual Conference Technical Programs and VE Site Coordinator at the Lawrence Livermore National Laboratory of the University of California in Livermore, California.
The data given by Table A, B, and C are from a 1993 report to the Congress by the U. S. Secretary of Transportation. The point of contact for additional information is:

Mr. Keith E. Borgenhagen PE
Value Engineering Project Engineer
Federal Highway Administration
400 7th Street, S.W., HNG-13
Washington, DC 20590
Telephone: (202) 366-4630

The Federal Highway Administration grouped the 48 states, District of Columbia, and Puerto Rico into three categories based on the level of VE activity in terms of the number of design studies over the past four years (see Table B). Seven states were grouped in the active category. In the inverse order of activity, these states are:

Pennsylvania
Florida
Virginia
Illinois

In the inverse order of activity, the following 27 States were grouped in the limited-active category:

North Carolina
Alabama
Iowa
Tennessee
Missouri
Arizona
Massachusetts
Kansas
Oklahoma
Arkansas
Oregon
New Jersey
Delaware
Wisconsin

In the inverse order of activity, the following 16 States, District of Columbia, and Puerto Rico were grouped in the inactive category:

Connecticut
Nebraska
Alaska
District of Columbia
Idaho
Kentucky
New Hampshire
South Dakota
Delaware
Wisconsin

Table A lists 1991 federal-aid construction awards. The notation "< 1" in the columns labelled NUMBER OF PROJECT denotes the number of projects under $1-million. The notation "1-3" denotes the number of projects of $1-million to $3-million. The notation "> 3" denotes the number of projects over $3-million.

Table B gives VE design study information by States for the years 1998 through 1991. Note that Pennsylvania heads the list, followed by California.

Table C gives VE change proposal information by States for the years 1988 through 1991. This time, the list is headed by California, followed by Pennsylvania.

The 7 active states have been involved with VE for 10-15 years and have energetic training programs to teach VE to their employees. The cost of road construction projects in these states averaged $360-million.

The cost of road construction project in the limited-active states average $137-million. The inactive states averaged less than one VE study per year and a total of only $3-million in savings were achieved by these states over the past four years.
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**Values Based on 1992 Survey of States**

Table **C**: Value Engineering Change Proposal Information by State
Role of the SAVE President

Larry W. Zimmerman, PE, CVS, FSAVE

People often think that technical experts make the best presidents of organizations. I agree that knowledge of the subject matter is vital, but the best criteria are leadership, vision for the future, empowering duties, and listening. Each of us ranks these four criteria differently, however, the main theme remains constant.

The president is the push to get things organized, and then the enforcer to see that things get done. A wholehearted love and enthusiasm for the profession will be obvious in your behavior.

As president, you are the leader, coach, motivator, navigator, and promoter of your organization and its membership. You have the resources of the entire organization available. With a professional association, the key assets are the people and their willingness to progress. The most important thing to remember is that you can do all the work yourself, but must develop a structure and communicate goals, responsibility, and authority for carrying out the actions of the organization.

The president must be well-versed in the principles of the profession, be cognizant of its background and history, and have an understanding of the organization's culture. This culture is defined by the pattern of behavior, and the often informal "rules" behind it, that evolve in different parts of the organization. This background will provide a basis for growth. For SAVE, experience in VE, certification, and conference activities, as well as international participation are important prerequisites.

In VE, you need a knowledge of many subjects. Industrial companies have a unique language at the managerial level. A knowledge of business terms, financial principles, and accounting practices are vital. Learn what is going on around the world in the business field. You will be surprised at how far a little knowledge will go.

Presidents, as entrepreneurs, are frequently marketers by nature. They focus on outreach to new users of their services or products. The SAVE President must be of this venue also, the spread of VE will depend on their marketing acumen. The universality of the VE methodology in so many industries and applications are its unique benefits. At the same time, making major inroads into so many markets is a difficult task. But the journey has begun.

As with many fields, listening is especially important. Membership concerns, needs, and services are learned by listening to conversations, letters, and by your responses to questionnaires. Chapter newsletters also serve as a good vehicle for disseminating information and hearing what is going on.

SAVE is blessed with many qualified and supportive members. In November, we were preparing for committee hearings on Capital Hill, and I called some 20 people asking for letters of support and examples of successes. From across America, the faxes were active. As President, these are the times when you are thankful for and proud of the caliber of your team.

In 1992, we rewrote the SAVE constitution and bylaws. You can imagine the task at hand. Sixteen board members worked for days to accomplish the task. We owe that board our sincere appreciation for their efforts. We see these Herculean efforts at the chapter and board levels, at our National Office, in our publications, legislative committees, and throughout the SAVE family.

It is gratifying to see such dedicated people. At last year's conference, SAVE Fellows met for the first time to discuss how to do more for SAVE and the VE profession. I look forward to other such meetings.
Another joyful occasion was the opening of the Miles Resource Center at the University of Wisconsin. This resource is a treasure.

Serving as SAVE President has given me opportunities to meet people, work with exciting projects, and to travel the world; meeting new colleagues and making lifelong friends. These opportunities to learn technology, management techniques, and cultures from around the world count among the many pluses and opportunities I wish all VE practitioners could experience.

I love the profession of value engineering. The past four years as SAVE Executive Vice President and President have been filled with excitement. I deeply appreciate the opportunity to serve you. VE is one of the most powerful methodologies available to businesses, governments, and individuals. During the four years, I have seen successes throughout the world.

As Executive Vice President, I was given the challenge of coordinating the long range plan and setting the goals, vision, and focus for the future of SAVE. Those of you that participated in this effort are to be commended for your foresight. As President, I was most interested in seeing this plan implemented, to see the new organizational structure put in place, and to elevate VE to where it should be, in corporations and governments throughout the United States and around the world.

My two years as SAVE President have been fulfilling, challenging, exciting, and motivating. I accepted the challenge of the presidency because SAVE was in need of change. To face the future, SAVE needed to move forward in a more proactive posture. We needed to inform those outside the VE circle of the benefits of VE.

There is much unfinished business at SAVE. As we approach the future, I hope that we will have more women and minorities participate in our Society. I am pleased that our new President that is not only talented and hard working, but is also a woman. Ginger Willingham will do an excellent job as SAVE President.

In retirement, I hope to stay involved in Manuals of Practice, legislative issues, Corporate Executive Forums, marketing SAVE to other organizations, and writing articles in Value World. Rather than Thunder (à la Tom King), I think Lightning might be appropriate.

Being President of SAVE has been a wonderful experience. I would encourage each of you to get involved. VE professionals become even more motivated as success stemming from their effort increases. The reward is commensurate with the effort and enthusiasm.

Mr. Zimmerman is President of SAVE and Vice President of Lewis and Zimmerman Associates, Inc. in Rockville, Maryland.
Buzz words often are used to describe acquisition processes and provide validity to an otherwise mundane process. Such is the case with "best value" contracting, a 90's term to describe a process used by the Department of Defense since the 1970s. This article will debunk some of the myth surrounding best-value contracting and provide a template for using this strategy to buy quality goods and services for the armed forces.

This is the first of a two-part article. The second will specifically explore the evaluation methodologies in applying best value.

BACKGROUND

During the Revolutionary War each independent colony competed for the resources needed to sustain that colony's fighting force. General Washington quickly realized competing forces did not make for a unified Army. One industrious colony could easily deplete regional resources, leaving nearby colonies in the lurch and unable to fight. The Continental Congress concluded that General Washington needed the sole authority to procure foods and supplies for all the troops and passed legislation authorizing him to purchase all necessary foods and supplies. General Washington, however, was fighting a war and had other more important matters on his mind. He chose to appoint procurement directors who, in turn, authorized agents to procure the necessary food and war supplies. These agents purchased from the local economy using their own funds to buy the materials. They were subsequently reimbursed based on goods sold, plus a percentage (cost plus percentage of cost). Needless to say, an agent could easily run up a tab purchasing either expensive material unnecessary materials, as the case may be. At the war's end, the Congress assessed the effectiveness and efficiency of the procurement system, concluding that while it may have been effective, it was not necessarily efficient nor did it motivate cost control. Other inefficiencies were also noted and thus was born congressional control over the procurement system through laws, regulations and statutes.

Laws passed in the 1800s and early 1900s focused on controlling how the monies were spent so as to result in the lowest possible cost. Specifically, costs could be controlled through competition and award of contracts based on lowest price. This practice became known as Formal Advertising (now sealed bid). Thus, the Congress created an environment where "best value" was the lowest price (bid) obtained by formally advertising. During World War II, value took on a different meaning when the Congress authorized the War Department to negotiate procurement. Value now meant that tradeoffs could be made among schedule, cost and technical requirements. Value could mean paying more money to meet a schedule (urgency). Negotiated procurement became the norm for the weapons systems and other high dollar value, technically complex equipment procured by Department of Defense.

It is important to note that before 1984, formal advertising was, by law, the preferred method of contracting. Negotiation authority was an exception, requiring approvals, depending on the dollar value, as high as the Secretary of the Department. The essence or heart of negotiated procurement is "discussion." Negotiation means compromise, and compromise was obtained through a process of dialogue between government and industry. "Best value" then took on a different meaning. Tradeoffs among technical characteristics, schedule and cost were necessary as both parties reached closure on the government requirement, budget constraints, technology constraints, technical complexity, and operational needs through the discussion process.

TIME NOW

In formal advertising, lowest price means "best value" and negotiated sole source was also "best value," where is the disconnect? Are lowest
price and negotiated price both best value? Given the policies perpetuated by the Congress between 1876 and 1984, both represent best value. The preferred method and preferred "best value" was lowest price.

With the passage of CICA, the Competition in Contracting Act of 1984, the Congress shifted the nucleus of the procurement system from how contracts were awarded (formally advertised vs. negotiated) to a preference for competition. The competitive method of procurement, Sealed Bid, Two-Step Sealed Bid, or Competitive Proposal Procedures, was to be selected based on the nature of the procurement, and the goods or supplies being procured. Sealed Bid and Two Step Sealed Bid require the government to precisely define the goods and service to be acquired with contract award based solely on price is the deciding factor, then the Government Accounting Office (GAO) ruled a sealed bid must be used and there is no opportunity to discuss or make tradeoffs. The Invitation for Bid (IFB) specifies the government's needs, schedules, terms and conditions. The industry submits a price (bid). The contract is awarded to the lowest bid meeting all the conditions set forth in the solicitation, and whose price is realistic and reasonable. Again, value is defined as the lowest price. All quality parameters must be specified in the solicitation.

Competitive proposal procedures, on the other hand, permit the government to tradeoff technical complexity, past contractor performance, management, and cost to achieve the "best value" for that procurement. The Office of Federal Procurement Policy issued a policy letter stating "quality of performance over and above minimum acceptable level will enhance agency mission and be worth corresponding increases in cost" clearly recognizes that greater value for each incremental dollar can be in the taxpayer's best interest. The Department of Defense (DOD) has been applying the concept of greater value since the 1970s when conducting Source Selections. However, GAO concluded after CICA that unless discussions were held the government must award to the lowest price or cost proposal. Hence, the proliferation of technically acceptable, lowest-price contracts because discussions are time-consuming and value judgments are required. Clearly, GAO communicated a relationship between discussion, tradeoffs, and cost/price as inherent and competing elements to arrive at "best value" decisions, concluding, as did our forefathers, that lowest price is usually best value for the taxpayer.

The current usage of "best value" emerged as the '90s term when using competitive proposal procedures because the Congress, in the 1991 Department of Defense (DOD) appropriations bill, changed the law. That change recognizes that, while many procurement actions are noncomplex, easily described, and appropriately decided based on price, quality, past performance and lifecycle cost also are major factors to be considered when selecting suppliers. Further, DOD could make the necessary tradeoffs among price, quality and past performance and award the contract without discussion, if it were so stated in the solicitation. Their rationale-industry had become accustomed to discussions as a way of life and used them as another chance to revise their prices via the request for Best and Final Offer (BAFO) process. If industry knew contracts would be awarded without discussions, then industry would submit their best price initially instead of waiting for the BAFO. Therefore, DOD is now required to state in the solicitation one of two conditions: The contract will be awarded with discussions or the contract will be awarded without discussions. If the latter is used and the government subsequently changes its mind, approval is required at a level above the contracting officer.

CONSIDERATION

As stated earlier, the best value may be a technically acceptable, lowest-price offer if all measures of effectiveness and quality standards can be stated in the solicitation and price is the deciding factor for selecting the supplier. The burden is on the government to be specific and precise in describing the procurement. However, where technical complexity, past performance, management issues and quality over and above minimum standards are paramount and more important than price, the best value definition is broadened. In this case,
some sort of benefit analysis is needed to support the greater value and worth corresponding to the increases in cost/price. Given the government's burden of proof, industry now has the burden of proof to demonstrate it can accomplish the procurement within government constraints.

Today, best value decisions are determined through a subjective assessment by a Source Selection Authority considering quality, technical characteristics, management approach, price, past performance, life-cycle cost, or other criteria unique to the particular procurement. Only the acquisition agent/buyer in conjunction with the user can determine the criteria to be applied. The relative value of each criteria/factor determines their ranking in the hierarchy and, in turn, how the criteria will be integrated. Further, the relative importance between the factors and price must be stated in the solicitation. A major consideration in determining best value is risk, both the proposal risk (can the potential contractors do what the proposal says?) and performance risk (do the potential contractor's records demonstrate an ability to manage risk?).

A Checklist for "Best Value Assessment"

- Past performance
- Ability to meet schedule
- Life-cycle cost
- Risk management
- Improvement strategies
- Responsiveness of management
- Supportability
- Conformance to requirements
- Reliability
- Maintainability
- Product improvement
- Cost Realism
- Terms and conditions
- User training
- Inter-system compatibility
- Mission configuration
- Personnel
- Capital equipment
- Mobilization
- Industrial base
- Data rights

When implementing best value, the government has the burden to continuously improve the selection process. Improvement begins with careful analysis of the mission needs and requirement to satisfy the need. Next is: How will the contract be awarded? if price is the determining factor then the government must be precise in stating the requirement. If, however, price is but only one of the considerations, what other factors will take precedence and how will the precedence be established? Is the potential contractor's management culture of such value that more emphasis should be placed on that culture? Are the potential contractor's past performance records a necessary element of the decision?

Best value is an assessment of many factors which can include any or all of the following: past performance, ability to meet contract schedule, lifecycle costs, risk management, product/service improvement strategies, responsiveness of company management, Supportability, product conformance requirements, reliability and maintainability, contractor strategies to make continuous product improvement, price differential for higher quality, terms and conditions, cost realism, user training, inter-system compatibility, mission configurations, personnel, capital equipment, mobilization and industrial base considerations, and data rights. The program manager, the contracting officer and industry must determine the specific considerations to be applied for a particular procurement to set the template for deciding which best value criteria are most appropriate.

IMPROVING THE PROCESS

The government has the responsibility to clearly and completely define all functional and physical requirements. Remember: "Value is a function of meeting valid mission needs."

Remember, the solicitation is a communication document. Written words can have different meanings depending on the geographic location and corporate cultures, so carefully choose your words and do not be afraid to be explicit. "Say what you mean and mean what you say."

Where possible, allow for both quantitative and
qualitative trade-offs between various price, performance, quality and schedule factors. While the decision itself is subjective, quantitative measurements may be appropriate in determining probability of success. The use of all quantitative measurements reduces the decision to numerical scores which may not reflect the relative worth of a proposal. For example, the end use of the item is critical in determining value and ultimate dollars to be paid. Weightings or specific numbers do not always convey that end use or military worth. A difference of a few points could make the difference in whether the war is won or lost. The template must be precise and communicate the what, how and why.

Encourage industry feedback by using Requests for Information and Draft Request for Proposals. Be flexible; the process is a learning experience for both parties. The government needs to be flexible and willing to listen and incorporate the contractor’s comments, otherwise the contractor will quit commenting. The government must avoid a rigid adherence to arbitrarily established requirements. This does not mean deviate. It does mean to listen to one of your customers—the contractor—who may know more about the item than you do.

Let the contractors do what they do well, design and build products. Reliance upon design specifications ties the contractor’s hands and does not permit innovation and creativity in meeting your needs. Functional and performance specifications give the contractor more latitude in proposing unique solutions and performing the contract.

 **SUMMARY**

Technically acceptable, lowest price has a place in our business. Hundreds, thousands of items are easily described and can be purchased off the shelf. They are not complex and price is rightly the determining factor in contract award.

On a continuum though, as the requirement becomes more complex, as military worth, loss of life is factored in. As safety considerations are keyed in, value becomes a paramount consideration.

Best value is no longer restricted to weapon systems, high-dollar value procurement, complex equipment or emergency use. Value is a consideration in all supplies and services. Lowest price may be the best value, but reasoned judgments to achieve an optimum balance among all criteria may also represent best value. However, reasoned judgments require continuous improvement and mean; in addition, debriefing those who did not win the contract by communicating specific reasons for not being selected. In today’s budget constrained environment, the next procurement is few and far between—industry deserves to know what they did wrong. As more quality principles are applied to the selection process, and as value decisions are made without fear of repercussion (protests), the quality of the equipment over time should improve.

Ultimately though, better equipment can be provided to the real customers, the men and women of the armed forces who must defend our country with the equipment we purchase. They deserve the best we can provide. It behooves everyone of us to remember that it could be "my daughter," or "my son" using that equipment. Would I want it to be lowest bid or would I want it to be the best that money can buy? I know what I would want my son to use!

In the next series, evaluation methodologies both to select criteria and to apply criteria to the decision process will be explored. There will be no right answers but there is a lot of room for thought in implementing best value.


Ms. Menker is the Director of the Executive Refresher Course and Professor of Systems Acquisition Management in the Defense Systems Management College at Fort Belvoir, Virginia.
BOOK REVIEW


The authors are well equipped to have undertaken this most unusual book on value engineering. Shillito is a consultant for value engineering and quality function deployment and currently works for Eastman Kodak Company in Rochester, NY. DeMarle is President of Icetek, Inc., a consulting company in Rochester, NY, and the SAVE Vice President for Education.

The book differs substantially from the average book on value engineering. The book is holistic in both its organization and realization. The chapters are organized in four sections: The Nature of Value; The Measurement of Value; The Design of Value; and The Management of Value. The subject matter flows logically from section to section.

On several occasions, the authors digress from the mainstream subject of value, but usually with a purpose. The dissertation in Chapter 1 on the concepts of energy conservation and energy conversion serves to support the contention that value is a force. This sets the stage for deriving formulation for the force of value that is analogous to the formulation for the force of gravity.

The discussion of quality function deployment (QFD), technology road map, and consumer-oriented product concept (COPC) is extremely lucid and gives the reader a good grasp of the importance of a total product concept in VE.

Discussion of the world’s most profitable corporations, and the population and gross national product (GNP) of various nations serves to illuminate the concept of valuism and its role in global competition.

On the down side, aside from occasional references in the context of managing value, the authors do not expound on the role of certain other disciplines that are key to successful value engineering. These are: concurrent engineering (which the authors call simultaneous engineering), design of experiments (in particular the Taguchi Method), design to cost, total quality management, and technical risk management.

The book is a well-written, scholarly work which cannot be read in a casual fashion. For example, Chapter 6 on value and decision making builds from discussions of signal detection theory and value energy standards and requires a fair amount of concentration. Nonetheless, the effort is warranted for those who desire to compete in the international marketplace.

The authors goal in writing the book was to infuse value and value thinking into broad segments of industry, academia, and government. They have achieved their goal. Value: Its Measurement, Design & Management belongs in the libraries of VE practitioners and serious students of value engineering.
"Thunder"—Czar of Tepid Affairs

Tom King, CVS, FSAVE

The SAVE Board has done a remarkable job in restructuring the functions and roles of our elected leaders.

Nevertheless, I bring to your attention an oversight; perhaps, a much needed position for which I now modestly promote: Czar of Tepid Affairs. That's right. A sort of ombudsman to ferret out substance from trifle and maintain harmony in the ranks. Often enough, VE issues of importance have arisen only to be battled to a draw in taprooms and left unresolved. More decisive resolve is needed.

In retrospect, few of these classic confrontations have drawn blood or separated brother and sister, but nevertheless, they've diffused our collective energies.

Some never ending issues of which I speak:

Name Game. An annual commiseration of the appropriateness of our current name Society of American Value Engineers.

Some are enamored with the acronym itself SAVE as it bespeaks to some of which we do. Others take umbrage with the limiting term American. Suppose it has something to do with the fact that members from forty some countries grace our membership. Still others tap dance on eggs worried that the use of the expression Engineer might bring down the wrath of Attila. Paradoxically, it is strange that few get excited that a janitor cops the term Sanitation Engineer.

Yes, I have a favorite: Society of Value Engineers or SVE. It seems gutsy, straightforward and all encompassing.

Size of VE Project Teams. In the same spirit that we defend our heritage, some practitioners advocate a precise number of bodies on a VE project team.

Albeit that the preferences range from a low of three, and anywhere up to a battalion. The ideal number most often expressed is five; matching the number of fingers and toes on a limb, or occasionally six in a construction study, because they need more help. If Czar, I would declare the quantity of members less important than the collective gray matter, skills, and attitudes assembled to get the job done. Now that's worth talking about.

Function Analysis vs Functional Analysis. True enough that VE people have erred in the use of the expression functional analysis, a grievous intrusion of an academic offering in existence.

As Czar, I would err on the side of leniency in meting out punishment. My tolerance stems from several factors; one being the generosity by which my given name, Tom King, is featured in phone directories in nearly every town, village or hamlet in this broad land.

Perhaps you too had the experience of being confused by the new buzzword - "Notebook", which I had heretofore thought I had possessed many of the paper variety. As Czar, I would leave the door open for an apology to academia over the functional issue. This would occur just as soon as a mere five percent of the college population featured value engineering courses in their curriculum.

FAST Diagrams. Do it always versus the bunch who never do it.

In this polarized scenario, much wisdom is necessary to declare a verdict. I'm reminded of the sage who successfully judged a contesting difference of opinion between a man and a woman. The man pled his case first, to which the judge responded, "You are correct, sir". Seeking a reversion, the woman frantically pled her case, to which the judge responded, "Well, it looks like you are certainly right". At this duplicity, an onlooker protested "Hey, they can't both be right", to which the judge responded: "And you too are right".

Considering this anecdote, the Czar would likely declare FAST to be a most extraordinary tool; but not one to be force fit into every nook and cranny or as a solution looking for a problem.

So, are you yet convinced a Czar of tepid affairs might enhance harmony in the ranks? If not, I shall anyway declare a moral victory and proceed to count how many angels can dance on the head of a pin.

Mr. King is a SAVE Past President and with Joy Technologies, Inc. in Franklin Pennsylvania.
America is populated by sleeping giants. Vice Admiral Chuichi Nagumo's utterance, "We have awakened a sleeping giant," symbolized the colossal political and psychological blunder committed by the Japanese high command in ordering an attack on Pearl Harbor. The attack mobilized American public opinion and became the catalyst for United States' entry into World War II. "December 7, 1941," said President Franklin D. Roosevelt, "is a date that will live in infamy."

The giant had been aroused. On September 2, 1945, less than four years later, the Japanese formally surrendered to General Douglas M. MacArthur aboard the battleship USS Missouri, anchored in Tokyo Bay. In the ensuing years, the United States helped rebuild their economy, in part by financial aid and in part by introducing advanced technology into Japanese industry.

Our technical leaders, stalwarts like W. Edwards Deming, J.M. Juran, and Lawrence D. Miles, the father of value engineering, were welcomed in Japan. The Japanese listened to them and followed their guidance far more than we did at home. The lessons, particularly those on value engineering, have returned to haunt us. The Japanese used value engineering to ensure that value is instilled at every stage of product development, contributing significantly to their domination of the world's marketplace. In the United States, however, value engineering remained a sleeping giant that would flex its muscles on occasions and then go back to sleep.

Value engineering recognizes that esthetics can be a basic function. The functional worth of a picture hanger may be the cost of a nail but, to an art gallery, the functional worth is the cost of some decorative fixture. It might be wasteful to use this fixture in a garage, but it would possess full-value when used in the art gallery.

Henry Ford introduced the Model T Ford in 1908 at the sale price of $800. The basic function of the Model T was transport people. (Value engineers express functions in verb-noun phrases.) At that time, the lowest cost means for carrying out the function was provided by a horse and wagon. If the rig had cost $200, the functional worth, or value, of the Model T Ford would have been $200. Had you purchased a Model T Ford at $800, your efficiency, from the VE viewpoint, would have been 25 percent.

At this juncture, however, value engineering would have considered the duty cycle of the basic function. If your intent was to use the Model T to transport people over the same distance as with the horse and wagon, you would have indeed spent $800 for something with a value of $200 and wasted $600 in the process. On the other hand, if the basic function was to be provided over extended distances, a single horse and wagon would not have been suitable.

In this situation, the functional worth of the Model T would have been the purchase price of the Model T (the only such vehicle available in America at that time). The purchase price would have been whatever Mr. Ford elected.
Does it make sense to try to keep the sleeping giant of value engineering awake and constantly alert? Consider the extent of government waste and reach your own conclusion. Assume that government waste is only 100 percent, a very unlikely situation. This means that every time the government spends money to acquire something worth a dollar, it wastes an additional dollar for a total expenditure of two dollars. In this case, government efficiency is 50 percent. Government waste of 200 percent means that every time the government spends money to acquire something worth a dollar, it wastes an additional two dollars for a total expenditure of three dollars. Here, government efficiency is 33 1/3 percent.

You can see how the relationship goes, except most people think that government waste starts at 1,000 percent or more. The perception is called the waste hypothesis, which says: "For every dollar of value acquired by the government, it wastes an additional ten dollars for a total expenditure of eleven dollars." According to the waste hypothesis, government efficiency is about 9 percent.

Consider the 1992 federal outlay of $1.475.439-billion (1992 Statistical Abstract of the United States). According to the waste hypothesis, the government spends eleven dollars for every dollar’s worth of value it acquires. Dividing eleven into $1.475.439-billion yields $134.131-billion. This amount is what the government would have spent had it operated at 100 percent efficiency. The balance of $1.314.308-billion was the government’s hidden wealth in 1992.

There are many definitions of value engineering, however, the most meaningful one is that value engineering is the best means for tapping the hidden wealth in government waste. Why haven’t federal agencies, states, counties and municipalities used value engineering to tap their treasure troves of hidden wealth? Perhaps it is disbelief, fear of exposure for prior practices, or just plain-old politics. It is certainly not lack of awareness with the recent publicity given to value engineering.

Fortunately, the sleeping giant is flexing its muscles more and more thanks to a growing number of advocates. Companies like Hughes Aircraft, Martin Marietta, and Westinghouse Electric have saved their customers billions of dollars over the past two decades. Hughes Aircraft has the distinction of generating the largest-ever value-engineering cost saving, one that netted the company $40-million as its share.

The most vocal advocate for value engineering is the Society of American Value Engineers or SAVE. SAVE, headquartered in Northbrook, Illinois, has lobbied the Congress with the message: "You can no longer afford to ignore value engineering." Consequently, the Office of Management and Budget has circulated Directive A-131 requiring the use of value engineering by federal agencies in projects with budgets over $1-million where appropriate. Recognizing that "where appropriate" in the federal bureaucracy usually means "nowhere appropriate" or "business as usual", several legislators are attempting to enact a law called Systematic Application of Value Engineering. The law would mandate value engineering in all branches of the government and, in some cases, state and local programs that are federally funded.

SAVE is also keeper of the value engineering seal of integrity. Its designation Certified Value Specialist or CVS is awarded to practitioners only after they have accumulated years of training and experience, have undergone substantial testing, and have been found worthy by a panel of their peers. Components of the Department of Defense, and federal and state departments of transportation and environmental protection now require value engineering under the direction of a CVS.

Federally aided highway construction cost the American taxpayers a total of $9.9996-billion in 1991. The value engineering saving in those projects amounted to $153.6-million. The saving was only 1.54 percent of the total cost, but as the late Senator Everitt Dirksen would have said: "A million here, a million there, and before long you have real money."

A small number of states and local governments use value engineering in their construction projects. The State of Washington enacted BEST, an acronym for Budget Evaluation Study Team, that requires value engineering as a
Team, that requires value engineering as a prerequisite for approval of construction projects with price tags of $3-million or more. Washington typically saves $3-million out of a proposed cost of $40-million, and that is real money.

Most other states do not practice value engineering with consistency. Consider the State of Florida that is burgeoning from the influx of refugees and people escaping the cold. In addition to the balmy Gulf of Mexico and the Atlantic Ocean, Florida is awash in a sea of red ink. Florida’s Department of Education has launched a task force to contain the escalating cost of school construction.

In essence, the department is trying to emulate its sister Department of Transportation that, for years, has managed to stay ahead of inflation with its value engineering savings. As a matter of fact, the Florida Department of Education was the recipient of the prestigious 1993 Davis Productivity Award in the Exemplary State Agency Category.

A one-day seminar on value engineering in school construction will be held on February 1994 in Orlando, Florida. Representatives from every school district, college, and university are expected to attend along with the architects, engineers, and builders who do business with the educational community.

The best advice for the State of Florida (and the other 49 states), its counties, and its municipalities is: "Use value engineering to tap your hidden wealth." For example, the state’s 1991 expenditures amounted to $54.331-billion (1992 Florida Statistical Abstract). Again, according to the waste hypothesis, Florida spent eleven dollars for every dollar’s worth of value it acquired in 1991. Dividing eleven into $54.331-billion yields $4.939-billion. This is the amount of money the state would have spent had it been operating at 100 percent efficiency. The balance of $49.392-billion was the hidden wealth of the State of Florida in 1991.

Value engineering could cure much of government’s financial woes. Like most medicine, however, it is a bitter pill for legislators and officials to swallow. The Society of American Value Engineers is at the forefront of the battle and welcomes all the help it can get. It’s a dirty job, but someone has to do it.

Dr. Jack V. Michaels is Editor in Chief of Value World and Executive Director of Management Science in Orlando, Florida.
Annual Indexes: 1992-1993

The Annual Index will be a regular Value World feature. This year, the index includes 1992 and 1993 as an accommodation to the readers.

Articles


Dare We Think Differently, Luis M. Venegas, PE, CVS, January 1992.

Dean Quixote, Sancho Panza and the Quest for Quality, Augustus Shackelford, MA, October 1993.


Follow Your Hunch-Wild Card Creativity, Theodore C. Fowler, October 1993.

Function Analysis, Dennis Betts, October 1993.


Organizing for Better Value-A Case Study from Tata Steel, R. N. Roy, April 1992


"Thunder" - They Do It all the Time-Not, Tom King, CVS, FSAVE, October 1992.

"Thunder" - Don't Let A Shark See You Bleed, Tom King, CVS, FSAVE, October 1993.


Winning the Competitive Edge through Cooperative Group Interaction-It Depends on the Task, Rosemary Fraser, Ph.D, October 1992.

Authors


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