

# 1993 SAVE PROCEEDINGS

## MODERNIZE YOUR VALUE ANALYSIS

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### ABSTRACT

Following a philosophical discussion on the unbelievability of value analysis (VA), a series of 13 innovations to the process are described.

### PROLOGUE

"VA is unbelievable" is an oft-heard refrain. It sometimes means that the remarkable effectiveness of VA may be hard to believe even though it is true. It sometimes means that claims of its effectiveness are so extreme that they are not to be believed.

VA has always suffered from both External and Internal Unbelievability.

#### External Unbelievability

To the top manager, the claims of the value practitioner often sound like self-serving puffery. The value practitioner tells him that in just a few weeks of effort, VA will deliver a better product which will cost 25% to 30% less. This is difficult for the top manager to accept. The claims are valid and are based on the repeated experience of the value practitioner. They are, to the otherwise experienced manager, nonetheless Unbelievable.

#### Internal Unbelievability

VA has evolved into a nearly infinite variety of forms. These evolutionary changes have sometimes had a questionable basis.

Often, the reason for the change in terminology or procedure is a desire for uniqueness for its own sake. The proliferation of names for the process often stems from such motivation. In other cases, the change is regarded as necessary to "fit" the process into the unique constraints of a particular organization. In many other cases, the change reflects a truly unique and useful reformulation of the VA process.

Whatever the reason, most value practitioners are poised, at a moment's notice, to present an impassioned defense of their particular form of VA along with a condemnation of all other forms. These justifications are generally met with skepticism by top management and particularly by other value practitioners.

Why the skepticism on the part of the value practitioner? Simply stated: If they use function analysis, their system works like gang busters. When you define functions as Lawrence D. Miles defined functions, you've got magic in your hands no matter how you play the game.

All dedicated value practitioners are true believers in their process simply because it works for them. They are therefore not interested in modifying their system because they see change as an unnecessary and risky variation on a theme which is the basis for their profession. To them, the claims of the innovator are, quite simply, Unbelievable.

### DISCUSSION

In light of the above difficulties, it would seem pointless for me to present an impassioned case for our unique form of VA. Hope and Don Quixote, however, reign supreme. This paper represents the case for modern, customer-driven VA.

This is the fourth version of the paper to be rewritten or rewritten since 1972. Each version was triggered by a discussion with a value practitioner who had presented a well-reasoned and

intelligently presented opposition to my system of customer-driven VA. The critic was usually someone who had become comfortable with his/her own VA system and saw little advantage -- and some risk -- in updating his/her system.

Customer-driven VA had its birth in the work of Thomas J. Snodgrass in the development of the Value Control system at GE in the early 1960s with Lawrence D. Miles and Sven Hvamb. Value Control was eventually perfected and was widely used within GE as a proprietary high level system for new product development. The significant details of customer-driven VA were developed and perfected by Snodgrass at Value Standards Incorporated in Chicago after his departure from GE. The system was later perfected in the crucible of the Xerox Corporation from 1968 through 1972, supported by unlimited funding and enthusiasm.

The techniques have been widely applied by Snodgrass, by the writer, by Thomas Cook and by several dozen others for many years. Since 1983, the worldwide application of modern customer-driven VA has expanded dramatically.

There are thirteen significant innovations woven into the customer-driven system. Each is discussed below in terms of its contribution to the total system. The product of these thirteen innovations is far greater than their sum.

#### ITEM ONE -- Customer Focus is Assured Through Worth Allocation

"The single objective of modern VA is to deliver to the user/customer the required functions at minimum cost." The key words in this quote from Van Nostrand's 1990 book, "Value Analysis in Design" are "user-customer". It is critical that we first assure that the product satisfies all of the needs and wants of the user, and only then assure that these needs and wants are fulfilled at minimum cost. This sequence of activities is unique to customer-driven VA and is a major contributor to its dramatic success.

Prior to the development of modern, customer-driven VA, the "science" of worth determination was an exercise which was developed in the early GE workshops and, surprisingly, is still a staple of many VA studies. The leader held up or pointed out a part and asked, "What does it do?." Team members responded with their opinion and the leader then asked, "Is that really what it does?" This caused the team members to reflect that perhaps they had incorrectly identified the function and they tried again. When the leader felt that the team members had correctly defined the function, he entered into a process called "basic function evaluation", wherein the key question is "What is the lowest cost method of accomplishing the item's basic function?" The answer to this question became the "worth" of the item.

This method of worth determination often served to alienate management team members, particularly those from top management or sales/marketing. They saw immediately that focusing on "basic function" ignored the realities of the business world. A butane lighter, for example, does not sell because it performs the basic function, "Produce Heat", but because it excels in delivering supporting functions which expand its features or enhance its dependability, convenience, or appearance.

Customer-driven VA established the worth of the functions of a product by interrogating the user, not the members of the VA team. The method used is the open-ended, face-to face questionnaire as pioneered by AT&T and converted to a VA configuration by Snodgrass. A more recent variation on the questionnaire was the VA focus panel suggested by Thomas F. Cook.

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In both cases, the resulting user responses are allocated to the team-defined hierarchy of costed functions in the form of a FAST Diagram. This allocated function-structure presents a visual image of the worth of each of the functions.

ITEM TWO -- Analyze the Complete Product, not Pieces of the Product.

Miles' Building 37 group at GE Schenectady developed the original VA process within a purchasing oriented environment. Many VA projects were therefore not complete products to which a user/customer could relate.

Customer-driven VA, with its prime focus upon the customer, requires that the VA team study always be defined in terms of a product, not a part of a product. This permits the collection of valid, unstructured user-attitude data. It also maintains the primary focus of the team on fulfilling the users' needs and desires.

Note that it is still possible to value analyze pieces of a product as long as the team viewpoint is in terms of the functions of the complete product of which the item-under-study is a part.

ITEM THREE -- Implementation is the First Step in the Job Plan

Historically, a VA study becomes concerned with implementation of results only after proposals for change have been prepared. This is often too late to take actions which will assure implementation. Modern, customer-driven VA initiates the implementation process as the first step in the VA process. The mechanism used is the Implementation Planning Worksheet form which is filled out by the team before the start of the VA study and is regularly updated throughout the study. If the team has anticipated effectively, it will find, upon reaching the development phase, that the road to implementation is considerably less cluttered. Typically, for any change proposal which reaches the final presentation phase, there are no surprises.

ITEM FOUR -- The Environment for a VA Study is Defined by the Competitor.

Modern, customer-driven VA, with its prime focus on fulfilling users' needs and desires, requires that all evaluations, including those of cost and worth, be in strict comparison with equivalent elements of direct marketplace competitors.

This requires that, in addition to the evaluation of function-cost and function-worth of the item under study, equivalent data be prepared on each significant competing product.

ITEM FIVE -- The VA Team, not Management, Defines VA Projects.

Historically, key decision makers in the organization selected projects to be value analyzed. A VA team was then assigned to study those projects. These decision makers were, with few exceptions, not qualified to make the judgement as to whether selected projects are appropriate for VA. Only a VA team is qualified to make this evaluation.

In modern, customer-driven VA, management involvement is limited to the identification of the product to be value analyzed, based upon factors that they are qualified to evaluate, such as design cycle status and importance to the future of the organization. The VA team carefully avoids selecting projects until they have completed their information phase activities, including function analysis, function cost allocation, and function attitude allocation.

The process by which VA projects are identified is called the value targeting process. Tom Cook uses the more dramatic term, "value mismatching" process. Whichever it is called, the process identifies projects in terms of function. Those targeted areas are, in the enlightened judgement of the team, functions which need, and can benefit from, VA.

ITEM SIX -- The Team Performs Cost Micro-Allocation to a Hierarchical Function Analysis.

From the early days of the VA process, a macro form of cost-function allocation has been a step in the formal VA procedure. When the Miles organization conceived the new process of Value Control in the late 1950s, they developed a new form of function-cost allocation to fit the customer-oriented requirements of the process. This is called micro cost-function allocation. It requires a different set of cost data and a new form of function structure. Further, it accomplishes a far more sophisticated and valid set of results.

The new process requires that each cost which is to be allocated be presented to the team in the finest possible breakout, down to the level of particles of material and individual labor operations to force the team to develop a clear understanding of the reason for existence of each element of product cost.

ITEM SEVEN -- The Paradox of Focused Creativity is Solved Through Use of Value Targets.

The brainstorming process, developed by Dr. Alex Osborn and first published during the formative period of VA in 1948, contains a basic principle that creativity doesn't work very well in the presence of constraints. The father of VA creativity, Eugene Von Fange, also emphasized that the human mind does not create effectively when a "judgmental" viewpoint is present. This means that any attempt to focus a creative session will severely limit its effectiveness.

The value targeting process, however, does focus creativity upon certain "targeted" functions. Does this limit the effectiveness of the creative effort? No, it does not, for two reasons:

(1) The unconstrained nature of a properly defined function, and

(2) The enforcement of the classic Osbornian rules of brainstorming with their insistence on freewheeling and the absence of criticism.

ITEM EIGHT -- The Full Creative Power of the Team's Minds is Tapped Through Use of a Three-Step Process.

From Arthur Koestler's "Act of Creation", we gather that the optimum creative problem-solving process consists of only three steps:

(1) Gather Great Minds. We accomplish this by carefully choosing as VA team members those key decision makers who already have the responsibility for solving the problem, led by the Project Engineer.

(2) Load the Minds. This is accomplished through the exercise of function definition and the rigorous micro-allocation of costs and user-attitudes to those functions.

(3) Establish a Conducive Environment within which team members can release the incubated solutions from their collective unconscious minds. This is ideally accomplished under Osborn's brainstorming rules.

ITEM NINE -- Brainstorming Results are Protected Through the "How Can I Use It" Principle.

The early years of brainstorming, as practiced at Osborn's Creative Education Institute at the University of Buffalo included a step which was strongly dysfunctional. It required that after the team had recorded a large number of words, ideas, concepts, or solutions, they review their flip-chart list and scratch out all of the recorded items which seemed ridiculous or pointless in relation to the problem under study.

The Modern customer-driven VA process requires that, before any item is scratched, it be rigorously subjected to a wide ranging inquiry responding to the question, "How Can I Use It?"

The necessity for such a ruling becomes obvious when we reflect that the very definition of creative thought involves the bringing into existence of something which is new, that is: something which was not previously known to the person or persons generating the thought. If the flip-chart item is truly new, it will initially appear to be ridiculous or pointless with

respect to the problem under study, and would have been summarily dismissed under the old rules.

In our practice, we have experienced hundreds of examples of the development of new solutions by VA teams which are treating each flip-chart entry as if it contained the seed of a breakthrough solution.

ITEM TEN -- The Champion Principle Improves Involvement and Therefore Implementation.

Customer-driven VA requires that a team member volunteer to become champion of an idea or concept which emerges during the synthesis phase. If no member of the team which created the idea or concept agrees to become its owner for the purpose of investigating its feasibility, the likelihood is low that it will ever be implemented. The rule therefore requires that an unchampioned item be summarily dropped.

During the several week period following the synthesis phase, champions typically devote themselves to their task of verifying the feasibility of the ideas and concepts which they temporarily own. Their level of involvement is markedly greater than that which is typical of team members at this stage of most VA studies.

ITEM ELEVEN -- The Preparation of Individual Proposals for Change is an Essential Step in the Process of Value Analyzing a New or Concept-Phase Product.

When the product under study is in the early concept or design stage or is subject to a fundamental redesign, there is a common temptation to bypass the step of preparation of proposals. Resist that temptation. Based on decades of good and bad experience, we have found that an essential element of dedicated, focused problem solving is lost unless each item which surfaces in the synthesis phase is separately treated to a full investigation by a volunteer champion. Without this focus, the effort tends to descend to the level of a general product review, and the dynamics of the VA team are compromised.

The proposals are later integrated into the product design during the development phase. A formal and often emotional melding session serves to integrate the proposals into a cohesive new product.

ITEM TWELVE -- Results are Taken to the Point of Practicality Through a Gantt-Charted Plan.

The structure of the design process varies greatly between organizations. Where this structure permits, the champions are given the opportunity in the development phase to again volunteer to champion their proposals and to commit themselves to overseeing the process of investigation until the proposal is either dropped or implemented. In other, highly structured reporting situations, this process is not practical, and the proposals are handed off to implementers.

In either environment, the modern customer-driven VA system requires that the original champion prepare a rigorous proposal, complete with an implementation plan which is supported by a detailed Gantt Chart. This assures that the proposal has maximum potential for ultimate implementation.

ITEM THIRTEEN -- A Loop-Closing Final Presentation Improves Team Member Commitment.

In either circumstance, that is; whether the team member champions are to maintain ownership or are required to hand off their proposals to other implementers, a formal presentation of results to operating management is essential.

While the final presentation to management was an essential element in the early Miles workshops, it has been eliminated or minimized in the majority of today's VA systems.

The prime reason for insisting upon this climactic event is to assure that throughout the VA process, the teams, and particularly the individual team members, have a focused goal. It tends to assure that all activities coalesce into a single integrated package.

## SUMMARY

These 13 significant innovations that have given us modern customer-driven VA with its guarantees of product improvement and product cost reduction may be applied by any talented VA practitioner if he/she can rise above the instinctive distrust of anything new. Review the discussion of each of the thirteen innovations. Reflect on the weaknesses of your VA system. I think you'll find a match. Start trying out the innovations. You will find them powerful and BELIEVABLE.