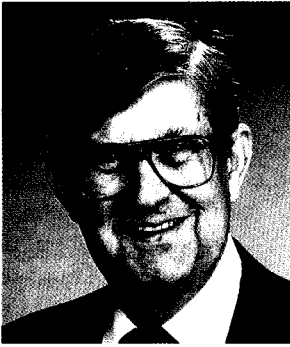


FORWARD TO THE BASICS: DON'T SECOND GUESS THE DESIGNER



(Second of a series)

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ABSTRACT

During its 40-year life, VA and the identical process of Value Engineering (VE) have undergone much significant change. Most change has been good. Some change has been bad. The first paper in this series discussed the increasing tendency to ignore the fundamental VA technique of create by function. This paper discusses another regrettable tendency: The increasing failure to require that the responsible Project Engineer be the key-person on any VA or VE team.

THE VA TEAM

The ideal VA or VE study team is composed of five or six people from different areas of expertise. Each of them must be presently assigned to the product under study and be an expert in his or her area of the product under study. Each of them must also be a person who would have been assigned to improve the product if there were no VA study. One of them must be the Key Person; the one who is responsible for the design of the product or process. In the VA of a product or process, this person is commonly the Project Engineer.

These last two requirements have been questioned recently, with several government agencies specifying that neither the key person nor

any other person on the present design team may be a member of a VA or VE team.

This conversion from a VA or VE study to a second-guessing exercise is unfortunate, and is likely the result of a lack of knowledge of the VA process by the government agencies involved, in the form of either: (1) a misunderstanding of the dynamics of the VA or VE process, or (2) a failure to realize that the problems they are trying to solve were long ago met and quite cleanly solved.

HISTORY

Essentially all modern VA and VE is performed in a team environment. This was not necessarily so in the first two decades after the development of the process by Lawrence D. Miles at the General Electric Company. The definitive *Techniques of VA and Engineering*¹ contains no suggestion of the use of teams.

Miles' concept was that a central "Value Services" group would identify and solve value problems. They would then turn over their results to appropriate authorities for implementation. This approach usually identified dramatic potential cost reductions and product improvements, few of which were ultimately implemented.

This "failure to implement" at GE had two very significant results:

- Management disillusionment, and
- A shift from centralized problem-solving to an in-product team orientation.

Management came to discount the predictions of the Value Specialists. The "Status Summary and Conclusions" reports from the Value Services Department became known as "The Fantasy Reports." This sort of management disillusionment has regularly damaged the reputation of VA and VE from the mid 1950s.

This general dissatisfaction with VA triggered the development by Miles of Value Control, a system whose objective was to prevent excess cost from being incorporated into the product or process during the concept and design phases. The Value Control system functioned where the true expertise existed — at the level of the management staff. In contrast with VA, this proprietary system was not revealed outside the General Electric Company.

A second result of the decline in the reputation of VA was a shift to an in-product team-focus, based upon the great success of the VA seminar used by Miles to rapidly spread the knowledge of the technique throughout GE. These seminars typically divided the participants into a number of three-person, cross-functional teams, each assigned to solve a different live project. Each participant was typically selected from personnel assigned to the project under study.

The seminars invariably resulted in product improvements and in cost reductions which exceeded the cost of the program, and the recommended changes had a way of very often being implemented. In fact, the common result of these seminars was an implemented reduction of cost of 25% to 40%, with a concomitant improvement in the product.

This successful seminar team image gradually supplanted the concept of a central Value Services Department. It led to the following set of firm rules for the structure of an effective VA problem-solving effort.

TEAM RULES

- 1 VA should be performed by a team
- 2 Team members should be experts in a variety of areas of specialization
- 3 Each of the team members must be a decision-maker; an expert in his/her area of specialization
- 4 The number of team members should be five or six

- 5 Team members should be those whose present responsibilities include the project under study
- 6 One of the team members must be the key-person, commonly the responsible Project Engineer

These rules have constrained the vast majority of effective VA or VE teams since the early 1960s.

During the 1980s, some of the practitioners of construction VE began to ignore rules 5 and 6. Perhaps a better word would be "reversed." Team members with experience on the project under study were actually forbidden! This clearly also eliminates the key-person.

It also changes the complexion of VE from a problem-solving system to a second-guessing exercise. The prime objective became the identification of errors made by the original design group. In addition, most construction VE programs have shifted their focus to the selection and implementation of preconceived or "packaged" solutions retrieved from the records of previously successful VE studies. This relegates the VE process to one of *Implementing Solutions* rather than *Solving Problems*.

It is important to note that a few of the most effective construction Value Specialists do not make these errors. Their results measure up to the best of the practitioners of Modern VA (VE).

The reasons given for the reversal of rules 5 and 6 usually include the following:

- 1 Those who created the original design find, for several reasons, that it is difficult to be creative. This smothers the creativity of the team.
- 2 The contractual and ethical constraints, and the fee structure for construction engineers and architects make the standard arrangement impossible.

The second of these reasons is simply an excuse for lack of planning. VE has become sufficiently standard in construction that contracts can be and often are appropriately prepared to anticipate the ethics and fee concerns.

The first of the reasons cited above was countered forty years ago by Miles, by his staff, and by the 238 Value Specialists throughout the General Electric Company.

Their conclusion, supported by every effective Value Specialist over the past 40 years, is, simply that:

A VALUE TEAM MUST INCLUDE
THE KEY PERSON

The reasons why this is the only possible conclusion are discussed below.

FACT: — The presence of the presently responsible designer on the team can stifle creativity. The designer might, explicitly or implicitly, prevent anything from being considered if it has been tried and failed. In addition, pride of ownership might prevent full cooperation in questioning the present design.

FACT: — If the presently responsible designer is not on the team, the range of proposals is severely limited, and a substantial proportion of the results will not be implemented.

DISCUSSION: — The validity of both arguments has been recognized by generations of Value Analysts and Value Engineers. Most have concluded that the only intelligent solution to this paradox is to find a way to use the presently responsible designer while somehow avoiding the possible resultant stifling of creativity.

THE MODERN VA or VE TEAM

Several improvements to the original VA approach were put in place between 1955 and 1975. They are in nearly universal use today.

- The team includes only decision-makers who are currently assigned to the project under study. One of the team members is always the key person or the presently responsible Project Engineer.

This key person is a minority of one on a five-person team.

The majority of the team (80% of a 5-person team) is comprised of respected experts in their areas of specialization who are very familiar with the project under study.

The level of actual or implied authority of the majority tends to prevent the minority from controlling the analysis.

- A further constraint on this control is the highly procedural nature of the VA process, particularly in the first four steps which are performed during the first three workshop days. The first step converts the labor and material elements of the product into verb-noun functions. The next step rigorously costs these functions. The third step rigorously establishes the worth of each of the functions. The fourth step analyzes function-cost and function-worth for each function to identify Value Targets. Creativity and synthesis are then focused on those target functions.

This process rigor prevents the presently responsible designer from exercising control over the actions of the other team members. It becomes a truly balanced design team, with each member contributing in roughly equal proportion to the results.

- The third and most critical element of Modern VA or VE involves the skill of the Value Specialist in working with the team members, and particularly with the presently responsible designers.

This is a skill which has evaded some practitioners.

Those who have not evolved this "people" skill often make the wrong choice. They elect to exclude the presently responsible designer from the team and thus they severely compromise the results of the study.

SUMMARY

The results of exclusion often limit the accomplishments of the team. Such second-guessing teams are singularly uncreative. They customarily accomplish little in product improvement, and their cost reductions range to 10%, of which an inconsequential 3% or so are eventually implemented.

Those practicing effective modern VA or VE commonly implement significant product improvement and usually implement 20% to 30% reduction on project cost.

REFERENCE

1. *Techniques of Value Analysis and Engineering*, Lawrence D. Miles, McGraw-Hill, NYC, 1961