

## After Brainstorming

(A Screening Ideas and Proposal Development Process)



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### ABSTRACT

The Value Engineering (VE) workshop includes the Pre-Event, the Information, Speculation, Planning and Execution phases. Some VE practitioners conclude the VE workshop after the Speculation phase, but in fact, this is when VE work begins.

In the Speculation phase, effective brainstorming will result in literally hundreds of ideas. The real work is in the Planning phase when the team sorts, combines and screens ideas into potential solution proposals. This paper describes a sorting and evaluation process that high grades the best ideas. The Execution phase the team converts ideas into solutions and develops those solutions into proposals.

Although this paper is presented as a "stand alone," it was written as a continuation of the paper presented at the 1998 SAVE International Conference titled "*The Pre-Event Phase*."

### INTRODUCTION

The Value Engineering (VE) workshop includes the Pre-Event, the Information, Speculation (also called Ideation phase), Planning (also called Analysis phase) and Execution phases. The Pre-Event meeting is held about 2 or 3 weeks prior to the Information phase with some members of the Executive Review Board (ERB), the Project Manager and key team members. In the Pre-Event, the Participants accomplished the following objectives.

- Identify, evaluate and rank 8 key project attributes.
- Determine a project "base case" attribute score.
- Establish a "Product Performance Profile" improvement goal.
- Identify sacred cows.
- Form the VE Project teams.
- Plan and execute the logistics of the VE event.

The details of the Pre-Event described above can be found in a paper titled "*The Pre-event Phase*" that was presented at the 1998 SAVE International Conference.

After completing the Pre-Event, the team is ready to start the 5-day VE workshop. During the Information phase, the results of the Pre-event meeting are presented to the full VE project teams and the team's resolve arising issues. A FAST model<sup>(1)</sup> graphically identifying the functions, displaying their function dependencies and describing the approach to resolve the project issues, is completed by the VE Team and dimensioned.

During the Speculation phase, the FAST model provides the team with insight into selecting those 8 to 10 key functions to brainstorm in search for ideas relating to resolving the project's major issues. The team brainstorms the 8 to 10 functions and captures the ideas.

The Flip chart tear sheets used to capture the brainstorming ideas are divided into 4 columns with headings as illustrated in Figure 1.

- Discuss the problem, or opportunity.
- Answer the three "problem definition" questions.
- Establish goals based on the problem statement.

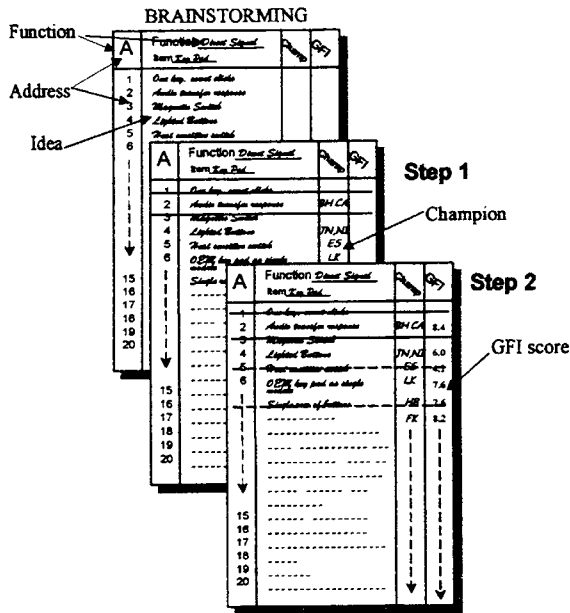


FIGURE 1. Flip Chart Tear Sheets

To move from the Speculation to the Planning then Execution phases of the VE Job Plan, the process is divided into 5 screening steps.

- Step 1 - Championing ideas
- Step 2 - Scoring Ideas (GFI)
- Step 3 - Seeking Solutions
- Step 4 - A Proposal Selection Menu
- Step 5 - Developing Proposal Scenarios

Each step in the process is more demanding in culling out weaker ideas in order to capture and spend more time evaluating the more relevant ideas.

### STEP 1 - CHAMPIONING IDEAS

With all the brainstorm ideas captured and displayed on the walls of the meeting room, the team members are asked to place their initials under the "Champ" column, next to those ideas they believe warrant further discussion. They are not limited in the number of ideas initialed, but if a team member doesn't believe an idea merits discussion they are to pass over and not initial the idea. An idea can have more than one initial because the idea can branch out into different approaches, or can indicate high team interest, which will be uncovered during the discussions in Step 2.

Ideas that did not receive initials are dropped from further consideration. However, the computer record, included in the appendix of the project report, will save the ideas for future reference.

### STEP 2 - SCORING IDEAS (GFI)

The fourth column on the flipchart tear sheets contains the idea score determined by the team after discussing the idea. The term GFI stands for "Gut Feel Index" and describes the scoring process.

Each member of the VE Team is given a set of cards numbering 1 through 10. The number 5 is omitted from the deck to eliminate the temptation of "sitting on the fence" when casting a judgement vote.

A team member is selected from the initials in the "Champ" column to describe the idea. The presenter need not be the originator of the idea. After a short discussion in which the pros and cons are voiced the facilitator will call for a vote. It is important that all team members present their vote card at the same time to avoid one member influencing the vote of others. The term "Gut Feel," a derivative of the Delphi Forecasting Process, encourages members to vote their own feelings and their intuition based on

As the team members offer the ideas the facilitator records the ideas on a tear sheet form. The first column on the tear sheet identifies the address of the idea. The address stays with the idea as it moves through the various levels in the sort process. The letter identifies the function and the numbers identify the unique idea posted under that function. In Figure 1, "A3" is the third idea offered for function A - "Direct Signal."

The second column briefly describes the idea. The third and fourth columns are used in the first two screening steps.

As each function category is brainstormed and the tear sheets filled with the first three columns, they are displayed on the walls of the meeting room for all the team members to review. With approximately 20 ideas to a tear sheet 300 ideas would fill 15 sheets, enough to cover a good size meeting room.

### RESULTS OF THE BRAINSTORMING PROCESS

Assuming all went well in the Speculation phase, we are faced with a mixed blessing. The good news is the each team developed between 250 and 350 ideas. The bad news is in the time remaining to cull-out those ideas that will result in the best proposals. Some VE Practitioners choose to conclude the VE Workshop after brainstorming, but in fact, now the VE work begins.

the short discussion. The individual vote is based on answering three issue questions appearing on the top of each card, as shown in Figure 3.

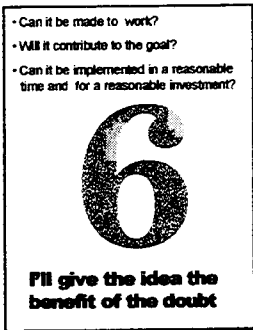


FIGURE 3 (Typical voting card)

The issue questions guiding the vote are answered subjectively, but focused on the conditions and expectation of the project. In answering the first question, "Can the idea be made to work?" team members are reminded that we may not have an acceptable solution in mind, but is it possible that a solution can be found? The second question asks, "Will it contribute to our goals?" This question recognizes that an idea may be faulty, frivolous, or may have great potential for different applications and is voted accordingly. The third question, "Can it be implemented in a reasonable time and for a reasonable investment?" is a reminder that the answer and the vote at this point is subjective, and the target range of the answer is broad rather than specific.

In keeping with the subjective nature of the voting process, an emotional expression appears on the bottom of each card as a guide in selecting the appropriate voting card. (See FIGURE 3).

With the team members casting their vote at the same time, the facilitator calculates the average score and records the result in the third column. At this point, the score reflects a team confidence in the idea. As an example, a score of 5.8 indicates that the team has a 58 % confidence level that the idea, when developed, will contribute to the resolution of the project issues.

When all of the initialed brainstorm ideas have been graded in all of the function categories, the team members review the range of scores in each category and decide the GFI cut-off score. This is the second sort and can be easily accomplished with the spreadsheet program. By sorting each function

category in descending order of GFI scores (column 4), making sure that the address is carried with the sort, the team can decide on a cut-off for each category. Ideas falling below the cut-off will no longer be considered in this meeting. Referring to FIGURE 1, Step 2 indicates that the cut-off of Function A was 4.2. Ideas scoring 4.3 and above made the cut and will be expanded in Step 3.

STEP 3 - SEEKING SOLUTIONS

Step 3 represents a transition from the Speculation phase to the Planning (or Analysis) Phase. It is during this step that ideas are converted into solutions. Entering into Step 3 writers are selected from the "Champ" column to write-up the surviving ideas, exploring solutions. All team members are assigned an equitable number of ideas to evaluate. The assigned writer can write-up each idea individually on a "Proposal Form" (Ref. FIGURE 4) or, cluster a number of related ideas into a single proposal. The Writers are allowed the full afternoon (and evening, if necessary) of the third Workshop day to join with other team members in consulting outside sources and collecting information to support a proposed solution.

Ref. No.s		<b>VALUE ENGINEERING</b>		Name					
GFI		Proposal Summary		Date					
TEAM		TITLE							
(Add additional pages where necessary)									
<u>CURRENT APPROACH</u>		Title of idea (s)							
(Describe current approach)		Idea(s) address(es)		Name of author					
		Project name							
<u>PROPOSED APPROACH</u>		(Add sketches where appropriate)							
(Describe proposed approach)									
<u>ASSUMPTIONS</u>									
(check "Yes, if...")									
Evaluate idea against project attributes:									
<u>BENEFITS</u> (Quantify where ever possible)									
(Estimate cost / time reductions and other benefits)									
<u>RISK</u>		<u>ATTRIBUTES</u>							
Sm Lo Med Hi		Unit Cost	Reliability / Durability	Name	Weight	Packaging	Crash worthy	Showering Effort	Sign of Install
		(-) Improved (-) Degraded (0) No effect							
<u>INVESTMENT</u>		Assess technical - economic risk(s)							
(NR Expenses needed to implement proposal)									

FIGURE 4 Proposal Summary Form

A similar display is configured in a computer spreadsheet program copying the information on the



The high water mark collects all non-conflicting proposals regardless of risk or other considerations, to identify the greatest cost reduction potential. Conflicting proposals are those that cannot be additive in the same proposal scenario. As an example; an alternate to detail component manufacture of a product is to consider an integral casting or forging. Both are viable approaches, but they are in conflict if used in the same proposal scenario.

The low water mark is a collection of small and low risk proposals. This scenario is often identified as "low hanging fruit," that is, proposals that can be implemented immediately with little if any investment and without requiring approval outside of the team's authority to act.

Once these limits are established, the primary proposal will be somewhere between those limits, dependent on the confidence of the team and the risk they are willing to propose to the ERB.

#### EVALUATING RISK

Referring to the Value Engineering Proposal Summary" form in Figure 4, the writer of the proposal decides which risk category is best associated with implementing the proposal and marks the box on the bottom left side of the form. The writers' decision will be reviewed, along with the complete form, with the team and edited, if warranted.

The risk categories and their descriptions are as follows:

**SMALL:** Recommendation has a small (if any) technical risk. Immediate payback, low investment, no additional testing required. Can be implemented now with the team's approval.

**LOW:** Recommendation has some low technical risk that can be resolved with available published information. Good payback potential, low customer visibility.

**MEDIUM:** Recommendation has good payback potential, but requires some development and testing to validate assumptions. No new technology involved.

**HIGH:** Different concept being proposed. High technical risk, but very high payback possible.

Requires a full development program to validate. Some new technology introduced.

The above risk descriptions are purposefully generic to fit a variety of study applications. When more detailed risk definitions are needed the risk descriptions are modified during the Pre-event discussions to make them case specific.

#### MULTIPLE TEAM APPROACH

If the project is large enough to be divided into sub-teams with each sub team focusing on a part of the project, new teams are formed into product teams containing representatives from all the sub teams. This will insure that each product team contains the knowledge to develop a complete proposal scenario. Figure 5 describes the results of a multiple team workshop. The colors (green, red, blue and brown) under major column 5 titled "Proposals," identify the 4 product team and their selected proposal scenario.

The product teams adjourn to their breakout rooms to deliberate the selection of their preferred proposal candidate, using the project goals, idea risk, impact on scenario, and other factors as their guidelines.

If all 4-product teams select the same idea, the idea is included in the preferred proposal. The same is true if 3 of the 4 teams select an idea, but the descending team is allowed to voice their views justifying why they did not select the idea in an attempt to sway the other teams. If 2 of the 4 teams selected an idea, the teams discuss the merits of the idea until one of the team's vote for, or against accepting the idea.

When the selection exercise is complete the preferred proposal scenario is evaluated and a business case developed.

#### SINGLE TEAM APPROACH

A similar approach is used with a single team. In this approach, the menu is projected on a screen through a computer projector. The ideas are discussed and selected for the preferred proposal. When a conflict is found, such the casting and forging example, a second scenario is started. At the completion of the selection process the team determines which scenario represents the preferred approach, and which the back-up proposals.

### CLOSING THE LOOP

The lowest cost proposal is not necessarily the best proposal. Cost may be an important project goal, but not at the expense of those attributes that make the product or process understudy a market success.

Referring to the "base case" attribute score determined during the Pre-Event phase<sup>(2)</sup> the proposal scenario candidates are scored against the attributes to determine the "best" overall proposal.

Please refer to the paper referenced to learn about evaluating attributes.

### CONCLUSION

Moving Value Management into the sphere of influence of Senior Managers necessitates an understanding of those business factors that attract Senior Management. This requires presenting the conclusions of a Value Engineering event in the form of a business case, not simply cost reduction.

A study for SAVE conducted in 1975 under the request of Mr. Jim Wilcock, then President and CEO of Joy manufacturing clearly demonstrated that Senior Managers are not interested in cost reduction, but how cost reduction can help meet the company's business objectives. Combine this conclusion with the fact that Senior Managers have more opportunities than investment resources to capture those opportunities, demands that VE's take a business approach to Value Management as a way to attract Senior Management. This involves business case justification, risk analysis, investment returns and other factors in place of VE brainstormed cost reduction ideas.

### REFERENCES

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