

THE VALUE IMPROVEMENT PROCESS

The Improved Job Plan

Timothy D. Karcher, CVS



Timothy D. Karcher is an Assistant Value Engineering Program Manager for the U.S. Army Industrial Operations Command. He is very active in teaching value analysis and leading studies on both hardware and process improvement studies. Mr. Karcher has a Bachelor of Science in Agricultural Engineering from the University of Illinois and a Masters in Business Administration from the University of Iowa. He is also a graduate of the Army School of Engineering and Logistics - Maintainability Engineering Program. Mr. Karcher is currently one of SAVE International's - National Directors for Government.

ABSTRACT

The Value Engineering Job Plan is frequently used to communicate to clients the steps in the value engineering process. Traditional VE Job Plans fail in two areas:

- They don't emphasize how value engineering is different from other techniques
- They don't emphasize a customer focus

Even the name "Value Engineering Job Plan" conveys little about the purpose of value analysis or value engineering, as it is sometimes called. This paper recommends renaming the VE Job Plan and its process phases to better communicate the benefits of the *Value Improvement Process*.

INTRODUCTION

Value analysis has continued to evolve ever since it was developed by Lawrence Miles, the father of value analysis. The Function Analysis System Technique and an increased emphasis on customer orientation have greatly enhanced the effectiveness of value analysis. Value analysis continues to be an extremely effective creative problem solving technique.

While value analysis has changed, the means we use to communicate the steps in value analysis have remained

fairly constant. Let's take for example the commonly used title Value Engineering Job Plan. Doesn't this title seem outdated? Is the title effective at communicating the purpose of the value analysis process?

There are several different versions of VE Job Plans. Most have 5-7 steps. One of the more common 5 step VE Job Plans is as follows:

- Information Phase
- Speculation Phase
- Analysis Phase
- Development Phase
- Presentation Phase

Do the above VE Job Plan steps (phases) emphasize a customer focus? Do they convey the importance of function in the value analysis approach?

This paper addresses the use of the Job Plan and its communication effectiveness. It propose changing the name of the Job Plan and its process steps to overcome traditional Job Plan weaknesses. The renamed Job Plan and process steps will be briefly explained.

A COMMUNICATION TOOL

The Value Engineering Job Plan is used as a communication tool. Typically it is used to:

- convince clients to utilize your services
- teach students the value study process
- describe the approach to value study participants

UNIQUE AND CUSTOMER FOCUSED

If clients are to use value practitioners' services, they have to be convinced of the benefits. Communicating the steps of the value engineering process to the client can differentiate the value analysis process from other productivity and cost reduction initiatives. An emphasis on value analysis' use of functions is key to setting it apart from the rest. Many practitioners utilize "Job Plans" with a *Function Phase* between the *Information Phase* and *Speculation Phase* to address this problem. Also, it is important to communicate that value analysis is customer driven. Nearly all management tools today have a strong emphasis on customers. What business can survive without them?

ORDINARY TO EXPLAIN THE EXTRAORDINARY

Ordinary words can explain extraordinary procedures. And that's just what you need to accomplish when describing the value analysis process. The use of ordinary words with precise meaning are the best choice for communicating ideas effectively. In his book "The Plain English Approach to Business Writing", Edward Bailey writes:

*"Writing in ordinary words doesn't mean writing with kindergarten language or producing only simple-minded ideas. Writing with "impressive" words does mean making the reader's job harder."*¹

Use of "impressive" words or non-specific words make readers think more about your meaning than the concepts you are conveying.

When describing the value analysis process we need to:

- **use specific ordinary words as much as possible**
- **emphasize function to differentiate value analysis from other techniques**
- **emphasize the customer orientation in the process**

RENAMING THE JOB PLAN

I recommend not using the title Value Engineering Job Plan when describing the value analysis process. The term "engineering" is a general term and is often mistakenly thought to apply only to hardware. The words "job plan" seem outdated and not very useful at describing the intent of value analysis. I recommend

using the title *Value Improvement Process*. *Value Improvement Process* is very specific and clearly indicates the intent of value analysis.

RENAMING THE STEPS

First, I recommend not using the word "phase". Phase is one of those "impressive" words that basically means part. The presentation of the steps of the *Value Improvement Process* in a numbered sequence clearly communicates that the steps are individual parts. There's no need to clutter the presentation with additional words.

Second, since we wish to convey the customer focus of value analysis we should use the word *customer* in a step of the *Value Improvement Process*. Likewise, the word *function* should be used in the steps of the *Value Improvement Process* to illustrate value analysis' uniqueness. Lastly, I recommend using more words and more steps to make the steps more specific and descriptive. The 5-step Value Engineering Job Plan uses only non-specific words such as *information* and *speculation* to describe steps.

THE VALUE IMPROVEMENT PROCESS

The following is what I believe to be a much more effective means to communicate the value analysis process than traditional Value Engineering Job Plans:

The Value Improvement Process

- 1. Project Selection**
- 2. Customer Analysis**
- 3. Baseline Configuration and Cost**
- 4. Function Analysis**
- 5. Identify Functions Needing Improvement**
- 6. Produce Creative Solutions by Function**
- 7. Select Promising Solutions**
- 8. Develop Recommendations**
- 9. Present Recommendations**
- 10. Implement Recommendations**

The above steps clearly communicate the important steps in value analysis. The customer analysis in step 2 illustrates that the customer is an up-front consideration of a value improvement study. The use of the word function in steps 4, 5 and 6 clearly defines the unique creative power of value analysis derived from function analysis.

The following is a brief description of typical activities and techniques used in each step of the *Value Improvement Process*.

1. PROJECT SELECTION

While technically not part of the study process, this pre-study step is important to the success of any value improvement program. The following are some indicators of what makes good study candidates:

- high cost drivers
- loss of market share
- customer complaints
- old or complex design

Management involvement and support to the study is essential. If management is involved in project selection they will be more likely to resource the study and implement recommendations.

Study team selection can begin after the project is selected. The study team should involve all the organizations that have a stake in potential changes proposed by the study group.

2. CUSTOMER ANALYSIS

Value is determined by the customer. It is a function of the consumers needs and wants and the resources it takes to acquire them.²

$$\text{Value} = \frac{\text{Needs} + \text{Wants}}{\text{Cost}}$$

This step of the *Value Improvement Process* involves determining how well your product and your competitors meet your users needs and wants. Specifically what do customers like and dislike about your product (and your competitors) and how important are those features to them.

There are several techniques used to determine customer information. One technique makes use of gathering customer attitudes from sources within your organization. The *A Priori* technique described by Snodgrass and Kasi in, "Function Analysis - The Stepping Stones to Good Value", is one such method. The advantage to this technique is you don't have the cost or work associated with gathering data from outside sources. The disadvantage is you don't have any data directly from the customer. Snodgrass and Kasi state some experts believe this to be about 75% accurate. This leaves a significant 25% of inaccuracy. It is common for companies to overestimate their own products features and underestimate their competition.³

Other more traditional market research techniques gather data directly from customers. Surveys,

questionnaires, market surveys, focus groups, personal interviews, and phone interviews. All of these techniques have their own advantages and disadvantages. Careful construction and execution of marketing techniques is essential. Leading questionnaires and interviews should be avoided. Open ended questions such as "Why do you like this product?" or "What don't you like about this product?" are preferred.

One technique described by Theodore Fowler in his book "Value Analysis in Design" is known as a focus panel. This technique makes use of a carefully selected group of internal panel members and external panel members. The panel should consist of approximately 15 members with an approximately equal number of members from inside the organization as from outside. Internal panel members should represent sales, marketing, field service, and engineering. External members should represent major customers who will greatly influence the future of the product or service under study. In this technique panel members look at the product/service under study and leading competitors. The likes and dislikes of the product/service under study are listed and their significance voted on Olympic style, with numbered cards. Internal members play the role of customers during the session and external members express their own points of view.⁴

When properly conducted customer analysis can be utilized to:

- **identify strengths and weaknesses in the item/service under study**
- **identify how significant competitors rate on key features**
- **identify relative importance of likes and dislikes**

3. BASELINE CONFIGURATION AND COST

Collecting information that documents the current process is essential. This establishes a baseline for which we can measure the merit of the outcomes developed. The team needs to have enough information to analyze the functions of the hardware or process and to assign cost of those functions. Accuracy of the data and the completeness of the data is essential to efficient use of the study team's time.

For **product design studies** the following data and items should be collected for use by the team:

- assembly and part drawings
- cost data (material, labor, overhead)
- manufacturing process sheets, including detailed costs

- tooling information and cost
- projected annual sales/production/usage
- specifications
- sample of assembly and parts

For **administrative procedure studies** the following data and items should be collected for use by the team:

- current policies and written procedures
- typical work unit, including forms
- detailed sequence flow chart for system under study
- time to perform each event and elapsed time for each event
- cost for each event performed
- storage/filing requirements

For **manufacturing process studies** the following data and items should be collected for use by the team:

- assembly and part drawings
- cost data (material, labor, overhead)
- manufacturing process flow sheets, including detailed cost
- yearly sales/production/usage
- specifications
- assembly and part drawings
- tooling information and cost

4. FUNCTION ANALYSIS

This is the heart of value analysis. Function analysis is the framework for defining the problem, understanding the problem and unlocking the doors to creative solutions. Functions are defined for each piece of hardware or process step under study. The functions are expressed using the verb-noun format. The functions are

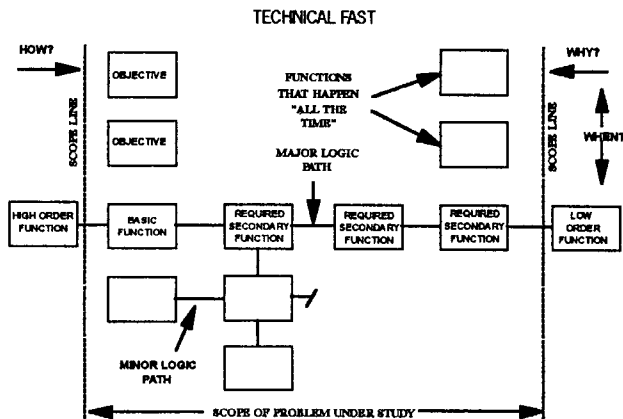


Figure 1

related using techniques such the Function Analysis System Technique (FAST). FAST diagrams make use of the How - Why logic to show relationships between functions. Two common forms of FAST are Technical FAST (Figure 1) and Customer Oriented FAST (figure 2).

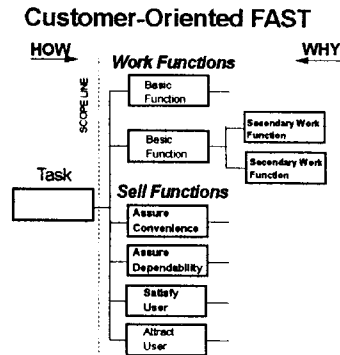


Figure 2

A workshop was conducted at the University of Wisconsin - Madison in 1975 to see if the Technical FAST and the Customer Oriented FAST techniques could be combined. The participants of the workshop recommended not combining them. They thought both had significant advantages. Participants thought the Technical FAST worked best on studies on components or parts of a total product. While the Customer Oriented FAST worked best to describe total products.⁵ It is my experience that FAST diagrams regardless of type are quite versatile. It is often a matter of preference.

And finally, cost are allocated to functions by the team. This task is not as easy as it sounds. It often takes some amount of subjectivity. Cost data is collected by part or process step. Process steps and parts can have more than one function. And conversely more than one part or process step can contribute to one function.

5. IDENTIFY FUNCTIONS NEEDING IMPROVEMENT

The next step is essentially to analyze the functions and the function cost to identify mismatches. Are unimportant functions costing too much money? Is enough money being spent on important functions?

Relative importance is one commonly used technique. Relative importance makes use of qualitative comparison of one function to all other functions. The significance of importance of one function over another function is rated using a numerical value. Using this paired comparison technique the qualitative ratings are converted to

numerical values. The numerical values are a good indication of the importance of those functions relative to the other functions. The Customer Analysis data can be used in lieu of or in conjunction with this technique to establish relative importance. The relative importance of each function is then compared to the proportion of cost associated with that function. The more important the function, the more cost that should be devoted to it. When mismatches between cost and importance are found, they should be investigated for value improvement potential.

Another technique is an evaluation of worth. Worth analysis is a benchmarking exercise. You determine the lowest cost to perform the function by comparison to other items/processes that perform similar functions. If the lowest cost to perform the function is close to the cost to perform the function under study, you have good value. If there's a significant difference then you have a value mismatch. Used in conjunction with Customer Analysis data this technique can also be quite effective.

Candidate functions for value improvement are:

- **Functions costing too much relative to their importance or worth**
- **Functions costing too little relative to their importance or worth**
- **Functions not fulfilling customer expectations**

6. PRODUCE CREATIVE SOLUTIONS BY FUNCTION

The doors to creativity are unlocked by using functions. Abandoning functions during creativity is an all too common error. Brainstorming should not center on "how can I improve the process or procedure?"; but on "how else can I perform the function?". The functions identified in step 5 are the functions which should be the focus of brainstorming.

When you create by function you disassociate yourself from the hardware or process you are trying to improve. As a result, you remove artificial constraints or mental roadblocks. The result is extraordinary - the true magic in creating by function.

Characteristics of a good creative brainstorming session:

- **create solutions by function**
- **wild ideas are encouraged**
- **quantity is encouraged**
- **building on ideas is encouraged**
- **criticism and judgement are forbidden**
- **record all ideas**

7. SELECT PROMISING SOLUTIONS

Next the ideas generated in the previous step are evaluated. Ideas can be modified and combined to develop feasible recommendations. Advantages and disadvantages of alternatives are judged along with cost analysis of the alternatives. Don't abandon ideas too quickly. Technical feasibility, cost, and the ability to meet customer specification/requirements are criteria that need to be used in the judgement process.

It's a good idea to identify a champion for each potential recommendation carried forward. If no one champions an idea, it has no chance at overcoming the roadblocks to change.

8. DEVELOP RECOMMENDATIONS

Potential recommendations are further developed. Negative impacts that might result from a recommendation are analyzed. If possible, any negative impacts are eliminated or minimized. Cost data is refined with improved estimates. The emphasis here is on specifics not generalities. Identify the decision maker and anticipate his concerns. Either make the recommendation saleable or drop it.

9. PRESENT RECOMMENDATIONS

An effective oral presentation communicates enough information to indicate a thorough study yet doesn't overwhelm the decision maker with too many details. Using a FAST diagram in the presentation is an effective way to demonstrate the team's thoroughness at analyzing the problem. A decision maker's time is a precious commodity. Your presentation should address key concerns of the decision maker. Return-on-investment, implementation cost, payback period, and risks to name a few. Change is never without risk, but improvement never comes without change.

Prepare a formal written report to complement the oral presentation and document the efforts of the study team.

10. IMPLEMENT RECOMMENDATION

No value improvement is achieved until it is implemented. Implementing a change requires planning and persistence. It is a natural organizational tendency to resist change. Good project management skills and management involvement are essential. After implementation, audit expectations to insure expected benefits are being achieved.

CONCLUSION

We live in a world of communication. If value analysis is to play a role in our society, we need to improve our ability to communicate its uniqueness and its relevancy.

The *Value Improvement Process* (VIP) presented in this paper represents a more effective communication tool than traditional "Job Plans".

- The name *Value Improvement Process* clearly defines the purpose.
- The specific steps outlined in the VIP heavily emphasize function, differentiating value analysis from other techniques.
- The **Very Important Person** in any business is the customer. Step 2 in the VIP process (the true start of the study) begins with the Customer Analysis. The upfront placement of Customer Analysis in the VIP communicates its importance to the value improvement study.
- The steps of the VIP are defined in more specific terms without being too wordy.
- Ordinary words are favored over use of "impressive" words.

Whether you're selling your services, teaching value analysis, or providing direction to a value analysis team the presentation of the value analysis steps is important. Effective communication leads to better understanding and retention of the concepts. Using the VIP instead of traditional VE Job Plans will give you the communication edge.

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