

# Overview of Value Engineering and Value Analysis

Charudatta Ahire<sup>1</sup>, Tanmay Chaudhari<sup>2</sup>, Prabhu Kanjoor<sup>3</sup>, Aviraj Chavan<sup>4</sup>, Shital Patel<sup>5</sup>

<sup>1,2,3,4</sup> Students, Department of Mechanical Engineering, Bharati Vidyapeeth College of Engineering, Navi Mumbai, India

<sup>5</sup> Guide, Professor, Department of Mechanical Engineering, Bharati Vidyapeeth College of Engineering, Navi Mumbai, India

**Abstract** - Though the two terms are used synonymously and philosophy underlying is same unnecessary cost elimination, there is a difference between the two. The difference lies in time and the phase of product life-cycle at which the technique is applied.

Value Analysis is applied to the existing product with a view to improve its value. It is analysis after the fact and it is a remedial procedure. Value engineering is applied to the design stage and thus ensures prevention rather than elimination.

**Key Words:** Value Engineering, Value analysis

## 1. INTRODUCTION

### 1.1 Value Engineering

Value Engineering (VE) is concerned with **new products**. It is applied during product development. The focus is on reducing costs, improving function or both, by way of teamwork-based product evaluation and analysis. This takes place before any capital is invested in tooling, plant or equipment. Value engineering should be considered a crucial activity late on in the product development process and is certainly a wise commercial investment, with regard to the time it takes. It is strongly recommended you build value engineering into your new product development process, to make it more robust and for sound commercial reasons.

### 1.2 Value Analysis

Value Analysis (VA) is concerned with **existing products**. It involves a current product being analyzed and evaluated by a team, to reduce costs, improve product function or both. Value Analysis exercises use a plan which step-by-step, methodically evaluates the product in a range of areas. These include costs, function, alternative components and design aspects such as ease of manufacture and assembly. A significant part of VA is a technique called **Functional Analysis**, where the product is broken down and reviewed as a number of assemblies. Here, the function is identified and defined for each product assembly. Costs are also assigned to each one. This is assisted by designing and viewing products as assemblies (or modules). As with VE, VA is a group activity that involves brainstorming

improvements and alternatives to improve the value of the product, particular to the customer.

## 2. ORIGINS OF VALUE ENGINEERING

The technique of value engineering gained considerable momentum during the Second World War. During the year 1947, Lawrence Miles, who was working for the American General Electric Company (GEC) became increasingly aware of the limitations of traditional cost reduction techniques. As a design engineer involved in cost reduction activities, was able to distinguish between what is good value and bad value and realized that very few people had a real grasp of good and bad value. He established that this is because of altogether a different approach. He evolved a set of tests that could be applied to any product either projected or being currently produced. Then he persuaded the management to try this technique which was already subjected to cost reduction exercises many times. The result was encouraging and soon the G. E. Company started using this to their products.

The technique soon spread to other American companies and later to Europe. It is now generally accepted by management as a powerful tool to ensure that unnecessary costs are not built into their products. The principle behind value analysis is that it is a functionally oriented method for improving product value by relating the various elements of product worth to their corresponding elements of cost. Thus value analysis allows the required functions to be performed at the minimum cost. To apply principles of value analysis effectively it is recommended that a systematic and rigorous approach is to be followed to ensure that no steps are omitted. Value engineering is a team approach. A team of people drawn from various specialist areas is found to be the best way to handle V. E. projects. The participating team members are drawn from design, purchase, production, accounts and marketing coordinated by an engineer belonging to any one of the above departments.

### 3. USES OF VALUE ENGINEERING

1. It is a cost prevention as well as cost elimination technique thus reducing cost of the product.
2. Helps employees for better understanding of their jobs and oriented then towards creative thinking.
3. Balance the cost and performance.
4. Prevents over design of components.
5. Motivates employees to come out with creative ideas.
6. Increases the profits and deflates costs.
7. Helps to satisfy the customer with company's products.

### 4. STEPS IN VALUE ANALYSIS

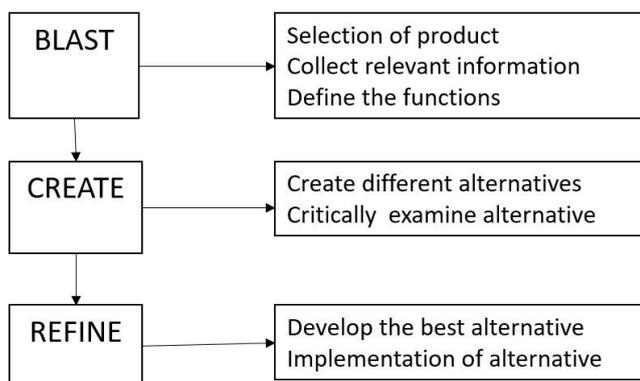


Figure -1: Steps in Value Analysis

### 5. WHEN TO APPLY VALUE ANALYSIS

One can expect very good results from application of value analysis at the proper time and correct phase of product. Life cycle. V. E. should be applied in case of the following indications:

1. Company's products are losing in the market and there is a decline in sales.
2. Company's products are priced higher than the competitors.
3. New design of products being undertaken.
4. Symptoms of disproportionate increase in cost of production.
5. Decreasing profitability and return on investment.
6. Company failing to meet its delivery commitment.

### 6. BENEFITS OF VALUE ANALYSIS

Value analysis is a methodical approach to sharpening the efficiency and effectiveness of any process. Often, businesses apply it to the processes used in product creation or service delivery. Paramount to the value analysis is the practice of breaking down a process into each individual component and considering ways to improve that component's value as measured by cost and importance to the process. General Electric developed value analysis during the late 1940s.

#### • Eliminating Costs

A critical advantage to using value analysis is its potential for reducing costs, which is a benefit that permeates all advantages of the system. Because value analysis breaks down a product or service into components, it enables you to analyze each component on its own, evaluating its importance and efficiency. A value analysis correctly implemented and applied allows you to identify components that are not worth the cost they require and that can be eliminated or replaced with an alternative. In this manner, the process for the product or service being analyzed is refined to be done at less expense.

#### • Modernizing

The value analysis process often allows users to root out practices that have grown out of date and can be replaced with more modern approaches. This is particularly beneficial when something has been done the same way for an extended period of time. Because the old way works and was new when it was instituted, you have had little impetus to make changes. However, a value analysis, which calls for questioning every step of a process, can reveal new methods that are cheaper, more efficient and sometimes more effective.

#### • Design Flaws

Value analysis can uncover design flaws that not only operate inefficiently but also create problems. In the case of a product, this could mean a high rate of malfunctioning items, creating customer complaints and warranty claims that put a strain on personnel and inventory. It also can lead to bad publicity and damage to the product brand and the company producing it. Similarly, in the case of a service, value analysis can help pinpoint design flaws in the customer support system that causes service to fall short of customer expectations.

#### • Customer Service

Value analysis is oriented to weigh costs and the benefit to customers of a product or service. It forces you to consider every aspect of a process in the context of how it serves the customer, which could be a consumer or another business. This means that each step in the process is scrutinized and questioned from the perspective of the benefit that it provides the customer. If the benefit to the customer is small and the step is not necessary for the product or service as a

whole, it can be eliminated, allowing you to streamline your operation and to reduce the use of resources.

## 7. TEN COMMANDMENTS OF VALUE ANALYSIS

1. Do not use a component or part that does not contribute to the value of the product.
2. Do not use a component or part whose cost is not proportional to its usefulness.
3. Do not provide any features to the component or finished product that are not absolutely necessary.
4. Accept the change if part of the required quality can be made out of cheaper and easily available material.
5. If the part of required quality is made by a process or method costing less, then do use the alternative process or method.
6. Use standard parts wherever possible.
7. Use proper tooling and manufacturing methods taking into consideration the quantities,
8. The cost of the component used should be proportional to its use or function.
9. Use the material, part best suited for the purpose.
10. Purchase the part instead of manufacturing in house, if suitable supplier can provide the part of good quality at the reasonable price.

## 8. CONCLUSIONS

In conclusion, the completion of a functional analysis exercise will result in a cost-effective design and will ultimately result in an improved competitive advantage. Value Engineering and Value Analysis is the systematic application of recognized techniques by a multi-disciplined team which identifies the function of a product or services; establishes a worth for that function; generates alternatives through the use of creative thinking; and provides the needed functions to accomplish the original intent of the project, reliably and at the lowest life-cycle without sacrificing project requirements for safety, quality, operations, maintenance and environment.

## REFERENCES

- [1] <http://www.businessdictionary.com/definition/value-analysis.html>
- [2] [https://en.wikipedia.org/wiki/Value\\_engineering](https://en.wikipedia.org/wiki/Value_engineering)
- [3] <http://www.advice-manufacturing.com/Value-Analysis.html>
- [4] <https://smallbusiness.chron.com/benefits-value-analysis-41686.html>

- [5] Industrial Engineering and Production Management by Martand Telsang.

## BIOGRAPHIES



Charudatta Ahire is an aspiring Mechanical Engineer, currently studying in Bharati Vidyapeeth College of Engineering. His areas of interest are Machine design and Industrial Engineering.



Tanmay Chaudhari is pursuing Mechanical Engineering from Bharati Vidyapeeth College of Engineering. His areas of interests are Automobiles and Design of Machines.



Prabhu Kanjoor is in final year of Mechanical Engineering in Bharati Vidyapeeth College of Engineering. His strengths are Business Management and Mathematics.



Aviraj Chavan is a final year Mechanical Engineering student of Bharati Vidyapeeth College of Engineering. His areas of interest are Operations research and Theory of Machines.