Explain the Effective Role of Value Engineering; Challenges, Solutions

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ABSTRACT
Value engineering as a powerful management technique, consists of systematic techniques application, which provides conditions for the minds of experts to create original and valuable ideas and creativity in order to improve the system. Thus, value engineering to optimize the management methods and thus is apply to increase the proper use of human resources and organizational creativity and enhancing performance. This paper prepared to briefly describes the value engineering process and scientific challenges on its way to overcome them.

INTRODUCTION

In today's world of high competition and the globalization of trade is heading the effort to improve performance is needed as main indicator of competitive advantage. This performance improvement is possible through reasonable price and high quality. It is also important to note that any company or organization may not be able to separate itself from the competitive market. To succeed in this competitive market, careful planning is very important in the design, manufacture and supply of goods and services. Doubtless survival manufacturing and services firms and institutions are equipped with the systems and mechanisms of strategic management and the cost of goods and services at competitive prices and to respond quickly to opportunities which reveal unknown capacity of organizations and firms to eliminate waste and improve the activities. Cost reduction and its relevance in today's value chain and its effect on increasing productivity as one of the measures of performance and always considered by experts, due to this fact, some large firms have begun efforts in this field and have achieved some success. High costs causes can be classified into external and internal factors, external causes problems mainly due to macroeconomic factors and internal factors, mainly refer to management, it means that management is not aware of the costs and cost reduction methods and techniques and does not acquainted of its requirements. Using new techniques such as value engineering in an environment where the use of it so far has not experienced any obstacles and challenges, which identify and provide solutions for eliminating them, is considered one of the most important success factors in the implementation of value engineering. This paper presents the theoretical concepts of value engineering and its impact on organizational performance; they introduce the challenges faced by these barriers.

2. Issue statement:

In today's global economy, undoubtedly survival manufacturing and services firms and institutions are equipped with the systems and mechanisms of strategic management and the cost of goods and services with competitive prices and rapid response to unknown organizations and businesses the opportunity reveals and track capacity to remove waste and improve the activity. Cost reduction and its relation to its impact on the value chain and increase productivity have been always considered as one of the measures of performance, industry by experts. Using new techniques such as using value engineering in an environment that has not experienced it yet with obstacles and challenges identify and provide strategies for eliminating them and considered as one of the most important factors for successful implementation of value engineering. Thus main question of this study is that the obstacles and the challenges faced by the management of the organization and what are the ways out of it?
3. Value engineering:

Value engineering as one of the most efficient and most economical methods known in the field of activity is defined as follows: Value engineering is an organized effort through the review and analysis of all components of a project activity, (From initial formation up to design and implementation commissioning and the exploitation stages) and finding practical solutions, provided implementation conditions activities at lower cost and the shorter time so that to maintain and upgrade the quality, safety, reliability and the ability to maintain the same designed level. Indeed value engineering method to find answers to the questions that what other solution do the production process or service with higher quality and reduced time and cost can be achieved. Indeed value engineering method find answers to questions what other solution can be achieved production process or service with higher quality and reduced time and cost. In the context of value engineering, project management, while paying attention to all components of the plan, there is no part of the decisive knows decisive (Younker, 2003).

Value engineering defined in terms of literal:

Value Engineering is composed of two words Value and Engineering; engineering has an Arabic root word that meaning the geometry and size of the recipient, the geometry of the universe, an established building and construction projects, road construction, agricultural and construction of all types of machines. Engineering is a science through which properties of materials and energy sources in nature for the use and convenience of man and will be visualized and useful in structures, machinery and equipment and various products. Activities range from engineering up to management, design, production, manufacture and use of products, processes and the systems encompassing the whole of human nature, and also includes human built. In its new form encompasses engineering human capital (in the form of money, machinery, equipment and the facilities) as well as materials and energy (Elias, 1998).

Value engineering defined in terms of conceptual:

Value engineering is a set of techniques guided for analyzing structured and creative functions, product, service or system, while they aimed to achieve the lowest total cost functions with peculiarities that constitute its value, such as performance, reliability, maintenance, appearance. Generally, the can be improved value of the product and the groups trained on these procedures (Elias, 1998).
- Diagnosis unnecessary costs
- Create different choices
- Promotion in innovation
- Create ideas and applying innovation and creativity
- Optimizing resources
- Saving time, money and energy
- Simplification of procedures and practices
- Remove or modify elements that are required for the function, are not necessary.
- Updating the standards, criteria and final goals.
- Adding hidden element which provides the needed functions.
- To improve the quality and efficiency of the elements, at the request of the user, even if not stated explicitly.
- Creating better performance at the same cost or less.
- Improve the shape, appearance, attractiveness and appearance to attract customers.
- Identifying Decoupled and remove unnecessary costs and the unnecessary parts or Consular
- Maintaining and the improving quality at the same cost or less.
- Avoid unnecessary use of resources

In Society of American Value Engineers definition mentions that: value engineering is team problem solving system to detect the function of a product or service produced / created that is applied with the minimum cost function. Value engineering is another kind of team problem solving system with performance outcome analysis (Society of American Value Engineers (SAVE), 1972). Sterr is defining Value Engineering as follow: Applying materials to create different solutions and the changes in product aiming at cost savings.

Also Anderson stated that: Value engineering to reduce costs and the better product or a cheaper alternative material (with former high quality materials) (Anderson, 1990).

Cooper in 1997 is defined Value engineering as follow: value engineering is a comprehensive survey of all the factors affecting the price of the product that includes the design, material selection, prototyping and the factors in the production process. Value engineering has attempted to preserve the quality and reliability of with study and willingness to maximize related three factors: price, performance and the value-added costs to the minimum and the value of the product price (Kalpakjian and Steven, 2000).

Regarding difference between these techniques with other techniques such as engineering systems, engineering systems that can be gets optimized to benefit and victims one parameter to another one (which is
considered more valuable) the value engineering, while only the parameters to reduce that are deemed unnecessary (Heller, 1973).

**Value engineering time applying:**
By the value engineering methods can be applied at all stages of project implementation however, the greatest benefits will be achieved when it is done in the early stages of planning and design because in early stages of the project concept and theory to the client and the designer more flexibility in their decision stages and reduces the effects of changes on the project schedule. Generally it can be said, before major decisions are taken in the design and Value Engineering is recommended it has the greatest effect on costs (Younker, 2003).

**Preliminary questions of value engineering:**
- Does this method work is the only way?
- Does doing this is necessary to continue in the project?
- Does it possible to eliminate some part of this stage?
- Does an unexpected cost can be reduced?
- Is it possible to change the type of material used or does it have? (Industrial, service and organizational)

**Value engineering implementing benefits:**
- Cost reduction
- Increasing profit
- Quality improvement
- Increasing market share
- Conclude the work in shorter time

**Value engineering schedule:**
Value engineering schedule is a model approach of performance and necessary outcomes to obtaining better and more effective solution to the problem. Value engineering schedule that use and recommended by FSAVE is made up of seven sub-phases:
- Information Phase
- Performance Phase
- Creativity Phase
- Assessment Phase
- Research and Development Phase
- Recommendation Phase (Cheah and Ting, 2005).

During the public phase, the process of organizing labor, identifying decision makers select the scope of work, allocation and organize the Performance orientation of teamwork. Value engineering work is to resolve the issues for decision makers.

In the data phase can be analyzed the special shapes. The general rule is to avoid accountability. All relevant information is collected accurately and significantly contributes up to the decision making process. Gathering facts and costs are determined. Quite natural that to deal with barriers should identify and crossed the problems.

Performance phase is consists of efforts value that are made. The main and secondary functions are defined. Value engineering is a cornerstone operation to express the combination of two words, in a verb and noun. First case represents the desired action that performs and the name implies one thing that the action is performed on it.

In the creative phase, are used new create methods ideas. This method creates a lot of ideas with regard to products, processes, methods, etc. to be used in order to achieve the defined Performance or functions. This method consists of two mental processes: Create and judgment. By harnessing judgment, create an array of ideas for defined functions. Treatment, assessment, and is carried in the next phase.

Creative ideas refining in the above, compared and evaluated in the investigation phase are subject to revise. Consultation with the seller, get help from industry consultants, company standards and the national standards that are used to lead to reasonable solutions, had no action is low cost and sacrifice, reliability, quality, safety, reliability and durability. In this phase used is diverse and numerous tests. Also the main question is, "Do you want to spend your money this way?" Before deciding on proper values, the answer will be given. As long as not all individuals responded positive to the above question cannot be trust to the level of created value. As we prepare for the advice and approval, thus is implemented worth of the option.

Some experts are emphasized on recommend worth of aspects. How to get it to strengthen the functions, and how it is proposed which decision maker approves it. This phase is called the implementation phase (Cheah and Ting, 2005).
Value engineering before being introduced as a technique based on a culture of professionalism. Creativity cannot be imposed only by law, but for basis estimates and the actual value creativity must first be identified as a culture. It can establish worth by value engineering creativity.

Results of the Value Engineering can be summarized as follows:
1. People become aware to items that need upgraded and attention.
2. Provides a tool to evaluate different options.
3. Provides possibility to expression and assessment costs as quantitative manner.
4. A way to generate ideas, and provide alternative solutions to the company.
5. The logic behind each decision determines as documentary.
6. Ability to summarize and aggregate information to better create new questions by using the numbers provided for evaluation.
7. To improve value and reduce costs.
8. To minimize complexity and reduce the production and service style and investment expenditure.
9. Enhance the quality or stability (not lower the cost of reducing the cost of quality).
10. Increase market share and ensure profitability.
11. Increasing market power in competition environment (Cooper and Slagmulder, 1997).

4. Challenges:
Value engineering such as a most effective quality engineering techniques, that gains all targets simultaneously include reduce costs, increase quality and customer satisfaction. As mentioned above, in order to implementation the value engineering there is a need for culture it should be noted, cannot be immediate action and began to study it, because the dimensions and cultural backgrounds, it is not correctly identified, thus, will remain just a beautiful name. The following will focus on some of the challenges facing the value engineering process in an organization (Baker, 1995).
1 - Lack of acceptance culture to change in organizations.
2 - Lack of professionals engineering in organizations.
3 - Misinterpretation and incorrect perceptions about value engineering.
4 - Incorrect implementation of value engineering techniques.
5 - Lack of implementation of value engineering at the right time.
6 - Lack of proper criteria for defining the value engineering.
7 - Lack of effective participation of all stakeholders in the organization due to teams preoccupation.
8 - Use ordinary people and lacks sufficient expertise.
9 - Failure to select responsible engineering team manager.
10 - Lack of complete and accurate understanding of the constraints facing with organization.
11 - Lack of adequate research in order to identify the preliminary phase in order to problem understanding.
12 - Incomplete conducted feasibility studies.

5. Conclusion:
Value engineering is one of the highly effective methods to increase productivity, reduce costs of new projects and is organized the current production. It should be noted that the value engineering emphasis solely not on costs reduction, this method is very comprehensive approach and built based on functional analysis (function) and is seeking for improvements in worth without sacrificing quality or reliability or longevity of the product. However, it is simply not possible to start any new business movement and naturally it will create challenges and barriers. However, identifying the challenges and barriers, and other factors affecting the implementation or non-implementation of a successful technique in the context of environmental factors, will help in dealing with this challenge. Given the challenges described in this paper and the solutions proposed to solve them continue to mention it.
1 - Breeding Value engineering professionals inside the organization.
2 - Formulation criteria for selecting projects for value engineering.
3 - Develop standards and guidelines for the use of value engineering.
4 - Making cultural habits and applying various methods of brainstorming.
5 - Using other experts in other sections.

REFERENCES


