



Effect of Value Engineering in construction and project management

Kavoos Amirkhani

Ma in civil engineering (administration and construction) -phd in business administration(DBA)-Lecturer in Red crescent scientific and applied university of khoozestan

Address For Correspondence:

Kavoos Amirkhani, Ma in civil engineering(administration and construction) -phd in business administration(DBA)-Lecturer in Red crescent scientific and applied university of khoozestan

Received 6 March 2015

Accepted 25 April 2015

Published 29 May 2015

ABSTRACT

Given that construction projects are time-consuming and costly, can be with offer and use of new techniques in the management of the project was to reduce these two factors, value engineering is one of the new techniques reduce the cost of a project that can be with value engineering studies and the use of all items of a project to achieve the optimal result. In The value engineering with use of person's creativity can be lead to ways to reduce the cost of the project; lake of application of value engineering in project creates many problems that are no secret on nobody of the project managers. In this study, tried to value engineering concepts is examined application of value engineering on the project and its effects in project management and economy.

KEY WORDS: Value engineering, projects management, Construction projects

INTRODUCTION

In recent years in construction projects such as dam construction, road construction, oil and gas oil, gas, complex construction, military projects and... . Talk of time span and operating expenses comes that in this regard opportunities and new fields created working for value engineering. Promote value engineering and risk is in during the both. In many cases, persons who are engaged in value engineering workshops. With attention to the depending on the type of project and the development of their ideas and with attention to the approach of persons who serve in the project, approach is cost reduction, therefore ideas expressed and given finally been approved and introduced as the output for the project whose implementation of the ideas associated with high risk, usually the best ideas of value engineering are the most risky ideas. In building construction, building quality has contributed impact in value of building, so employers and manufacturers are trying to raise the value of building from proper design methods and strict implementation of optimal, therefor employers with selected consultations and designers achieve to new designs and accessed to this status indebted to holding the value engineering sessions.

Value engineering is scientific that considers a project or plan based on the analysis and full consultation and collective advantages and disadvantages, considering the project found the ideal exploitation. In most countries of the world; European countries particular, value engineering has been application design and project implementation as a symbol of saving time and costs.

In this study has been tried that value engineering for review discussed on the type of appropriate design and implementation.

Research History:

Mr. Mootanah and et al in year of 1988 discussed on the subject of value engineering strategies in project and discussed to the relationship between value engineering and risk and following a consolidated approach of value engineering and risk in projects.

In year of 2004 Mr. Clinflock subject of the use of risk management examined in value engineering.

In year of 2006 Mr. Dallas subject of value management and risk gathered in a book that is resource for consolidated utilization of value engineering and risk management in projects.

Also Mr. Wu in year of 2000 improvement in project costs examined with using of value engineering.

Research Method:

In This study, library studies and workshops has made in the fields of value engineering in project that with this studies carried out in various items of a project whose is design and implementation, to can be implementation the application of value engineering and dos and don'ts and utilization of good ideas and management of a project convert in an ideal way and the economy that design and implementation feedback and them operation is evident and undeniable.

Definition of value engineering:

A system is a series of different parts that all in one direction pursuing a common objective. Value engineering is too a system comprised of coordinator creative methods that their objective is remove unnecessary costs and enhance safety and quality and efficiency over the life of the project which in fact is of all terms explanatory the high value of the project.

Value engineering in each project is including study, information of functionality analysis, creativity phase, evaluation phase, development phase, decision phase, offering phase, study that to in the form of three stages has been summarized in the following:

The primary studies stage:

In this stage project status, type of project, the conditions governing it and etc. overall, project information will be placed at the disposal of value engineers to with general trend of project have necessary acquaintance and with their area of work have necessary acquaintance in this project and necessary thoughts have to do proceedings in project future.

The secondary studies stage:

In this stage the project was analyzed with attention to primary studies of project and chooses the best methods to continue and many ways to consider ways to optimize performance and between these methods choose the ideas and modes that is possible for the development and proper functioning and finally used the best option for realization of value engineering and finally agreed project employer and stakeholders sought to value engineering solutions in project.

The final studies stage:

In this stage value engineering workshop held for value engineers and the results of this workshop to approved contract placed review and analysis design made realized as well to process results and outputs of value engineering studies.

Make decisions about acceptance of value engineering workshop proposals:

We can after provide the results of the workshop with modeling of the entire project compare rate of reliable and results possible risks with design and this situation compared the rate of proposed options risk in go against the basic design of the project raised to possible of acceptance the value workshop results.

The Value engineering position in project design process:

The architects for the design considering the criteria of employer consider and within a specific time that is a usually short-term venture to the design that parameters influencing the design map are very high, so the designs is usually resort weaknesses and defects, so the method that can destroy a design defects and increases the value of a project, value engineering with specialization inspection of a plan with attention to the employers criteria and building efficiency and costly items and appropriate tests it will review for save if this is done thoroughly review value engineering can systematically reduce costs and enhance the value of the plan in two directions, in this regard, with the elimination of unnecessary items and related costs to be reduce cost. In projects of our country all cost is more than whatever that expected, therefor in most developing countries, value engineering having very important with attention to economical projects, In project management value engineering has relationship with three items of cost, quality and time, so value engineering with performances analysis and applying the experts creativity in the field having focus on improvement and integration of manpower and equipment resources to can in this way, obtain quality and appropriate cost.

Evaluation of the plan:

According to the employer requires of a project can be considered various plan for it for example, in a building plan in different parts of plan namely the architectural design, structural design, mechanical & electric

design can be designed with attention to the numbers of floors and type of loads on types and different shapes and for design should in the comments different criteria and this criteria measured and analyzed for example can be investigated beauty, safety, efficiency, plan implementation, ... in one design and find out to the ideal design.

Project stage	value topics
Implications	Identify the objectives of the project in relation to the values with verification of employers
Feasibility study	Analysis and recommended design options against the objectives of the project for value had searched
Primary design	Recommended key performance test and design options system against the project objectives and values identification to achieve an acceptable plan.
Detailed design	Analyze all detailed options go against value and risks for achieve to the project objectives that causes overall access to the overall design agreement.
Manufacturing	Manage and monitor on value and risk for achieve to the project objectives ...
Exploitation and maintenance	Re-evaluation of customers' demands and identification of the objectives and organized strategies of the value for a life cycle.

Data gathering:

In this part first examined plans and technical specifications prepared by the consultant as regards the building is included mechanic and electric building. With attention to this building section allocated to it about 60 to 70 percent of project costs and building it is including structures, architecture, and enclosure that building section allocated to it about 60 percent of this costs. With this building section each design can be good option for value engineering studies and investigate the fine items can to be followed reduce of costs.

Creativity:

In part of creativity the discussion is ideas analyze that lead to creativity, for example in constructions, first species of structures that consider included concrete structures, implementation bearing walls, metal structures with rack, first for select the type of structures and frame handed to ideas storm. That factors affecting review in structure selection, number of floors in architecture, arrivals, length of mouth, so in this stage ideas storm building structures, select a frame type construction and all theme items (columns, beams, and roof) that in these statuses obtained the ideas that a series of that is not approved the employer and a series is approved.

Evaluation criteria:

On the bases of the research will be achieved results that discussed criteria such as safety, the operation of manpower, initial costs, implementation, project life cycle and serve as a case in the one project can review the building construction, dam construction, road construction, ... and value engineering studies expand with attention to the desired criteria in design and implementation of project management.

Acceptance of value engineering proposals:

After this status and announcement of the Value engineering workshop results can be with create model compare the reliable and risk of results with initial plans, in this status proposed options that won top rated and in term of operational risks and project condition and safety considerations perch analyzed as the value engineering team and with nobody problem was been diagnosis executable.

Elementary process:

The executable process prior to conducting group work that have been designed with the primary objectives of the project definition and ranking them based on the degree of importance with value engineering model complete project risk and reliable rate contained in the preliminary results can be compared with the designer and this status the proposed options that has the most points and in terms of the risks and safety considerations in terms of project and value engineering team about Analytics and applicable without any problem was diagnosed.

Executive processes:

The executable process before the holding of workshops have been designed in such a way that the primary objectives of the project definition and ranking of their importance degree by looking at them based on value engineering for risk and value workshops are guided. As regards the definition of the goals and values with risk guidance workshops are concerned with defining goals with holding workshops is imperative. As regards the definition of the goals and values with risk guidance workshops are concerned with defining goals with holding workshops is imperative. The quiddity of value engineering is a related project with the objectives of this work to identify individuals and project managers ' also helps at this point with the question of the development goals and they are all opportunities in finality are placed into consideration.

These objectives with verification of employer and the project team to determine the ranking and creating ideas ready, this part of the process that is dependent on successful results. The initial value management doesn't attention just to the initial project needs but also have attention to opportunities that will enhance the value of

the project, after ranking, the goals of the project team to identify the values and hard to reach these goals are paying. This step makes the perfect project team preparation for admission to workshops and holding whatever the desirable information. At this stage the feasibility of proposals designs is done for implementation in the project. So at this status, all of the information needed provide to hold workshops and value and be identified as the focus points.

Final processes:

At this stage for convinced the project team to ensure the final and common ideas between existing risks and value engineering has been designed, at this status can by identifying the best ideas, at this stage the purpose is find the items that have an important role to play in the success of the project. Value and risk workshops must be formed quickly to needs of the project and meet the people carried out with projects in other words makes clearer to the project and people individual to them and help more in applying to discussed the value engineering.

Holding this workshop, such as magnifying glasses, nose that affects parts of the full potential and open them and its details, after the holding of workshops, the most important ideas to improve risk and the value of each of which we will choose the best, and any item that the project management and the employer was willing to add it to list of ideas they are based on the calculated index balance finally, ideas that have a high index of select balance can be Fermat's work and introduced.

Conclusion:

Construction costs of a project in our country to bear fruit more than expected. In most cases, the design and implementation of a project also complements can be the cause's additional costs and non-economic in project. So in a project its design should be considered first for the status of value engineering in all items and in the implementation of the project to be carried out status to can determine good way out the value of a project. Extensive studies in the project took place in forms of research that can be used this achievements in the discussion of project management and will be well-made the value of a project.

Designers' not included economic criteria in the design which can be importing a huge cost to the project that employer do not take it in the preliminary analysis, the value engineering with efficient planning for eliminate the expensive areas makes that with data gathering venture and analysis with identifying the needs of the project employer and stakeholders and managers and building components segmentation in the total track with particular specifications and with the study to these components can be specified most costly and by replacing other methods instead of the desired component enhance the economic value of a project.

So by investigate the total of component cannot be removed non-economic components of a plan and with and with the appropriate analysis considered a replacement for it that can be improve the plan in general and to the additional costs stop that reduce from the performance of project. The combine of value engineering and risk management recommended in a single study program and it's logical because its supplement. Therefore, for optimize the project can be considered also risk, if in implementation considered the value engineering to risk management can be considered a balance status between the values and risks in the project and enhanced chances of the project's success. Therefore recommended the employers, project managers, put themself future plans in order to institutionalize the use of risk management in projects and training of value engineering specialists and experts to in long – term the results of the implementation of these two techniques be determined by work team.

REFERENCES

Michael thomppson, 2004. value solution-apath to sustion in frastructure incorporating risk into value engineering,csva conference-toronto.

Dejmark, mark w.kimberly a.ford,save international confrance beardsall, d, 2003. value risk and uncertainty, the institute of value managment

koga, m, 1996. probability, risk and value engineering in construction ,save,international conference proceeeding

Bleasdals, r.c., 2003. construction.modeling-linking risk managment and value engineering, save international conference proceeding Washington University desin standards for architectural building components

Stephen j, kirk, 1998. creative b design decisions,van nostrand reinhold company.

Alphones dell iso la, pe, 1997. value-engineering:opractical application,means,company.