

Vm was originated in
the general electric
construction essay



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The VM was originated in the General electric Company in USA during the Second World War, when scarcities forced industry to consider ways of economizing resources or using substitutes. This process was called Value Engineering or Value Analysis, and was mainly concerned with the functional analysis of manufactured products (Barton et al. 1999). VE first entered the construction industry in the early 1960s when Value Engineering incentive provisions were included in construction contracts. Over the past decade, there has been a trend toward applying value techniques at ever-earlier stages in a projects life cycle. To distinguish this activity, the term " Value Planning" has arisen in a growing nr of organizations to describe more strategic-type value studies undertaken at early conceptual design stages. In addition the term VM has become a blanket term that covers all value techniques whether they entail Value Planning, Value engineering or Value analysis (Norton and McElligot 1995).

2. 2. 1 Value

Thiry (1997 cited Othman 2008) stated that value is a very subjective concept; it has different meanings for different people. A customer will regard it as the " best buy", a manufacturer will consider it as " the lowest cost", and the designer will view it as the " highest functionality". Dell'Isola (1997 cited Othman 2008) stated that three basic elements that provide a measure of value to the user: function, quality, and cost. $Value = (Function + Quality) / Cost$ (LCC) Where: Function = The specific purpose or work that a design/ item must perform. Quality = The Client's or user's needs, desires, and expectations. Cost = the total life cycle cost of the product. Ecoman (2001 cited Othman 2008) argues, maximizing the relationship of these

three elements is necessary to satisfy the customer. From this relationship it is easy to see that value could be enhanced by improving either function or quality or both or reducing cost. But Norton and McElligot (1995) argues that cost is one element relative to value on a construction project. Two other elements are time and function or quality. In order to achieve value, it is necessary to achieve a proper balance between all of the important aspects which makes up a project's design.

2. 2. 2 Value Planning, Value Engineering, Value Analysis, and Value Management

Phillips (1995) explained the terminologies as:

Value Planning

It precedes VA and VM and is aimed at developing, through early stake holder consultation, corporate values for a range of parameters as applied to the activities and aspirations of the organization. These parameters mirror the potential risks which include aspects of ecology/environment, health, safety, sustainability, community wellbeing, litigation liabilities and penalties for non compliance.

Value Analysis

It is conducted during the planning stage of a particular project and is specific to the process or service to be developed. VA is a mechanism to enhance project conceptualizing and definition, together with agreement of appropriate quality parameters.

Value Engineering

It is project specific and is conducted at the implementation stage (during the design stage). VE examines the functionality of proposed project elements to optimize design and ensure best value for money over the total project lifecycle.

Value Management

QualityVPPlanningVEDesign & DevelopmentVAProcessIt is the all encompassing "parent" methodology and focuses on (and aids confirmation of) those value characteristics deemed most important by the stakeholders.

Figure 20 - The lever of quality

(Source - Male et al. 2004)

But Shen and Liu (2003) argues that, Although some schools of thoughts tend to distinguish VM from other relevant terms such as VE and VA, it is more widely accepted that the term VM can be used to represent other related value methodologies. Also BRE (cited Kelly et al. 2004) states that it is not important what the process is called but it has opted to use VM as an all-embracing term for any application.

2. 2. 3 Value Management

Various types of definitions can be found for VM. According to AS/NZS 4183 (Standards 1994 cited Lin and Shen 2007), VM can be defined as a structured and analytical process, the purpose of which is to seek to achieve value for money by providing all of the necessary functions at the lowest cost consistent with required levels of quality and performance. All of the definitions stress that the VM is an effective, organized, systematical team

approach for enhancing value for money by eliminating possible costs without compromising desired performance. Norton and McElligot (1995) identified the type of projects that benefit most from VM namely, Costly projects, Complex projects, Repetitive costs, Unique projects with few precedents or with new technology elements, Projects with very restricted construction budgets, Project with compressed design programmes and High visibility projects. VM can produce "hard" savings, those directly linked to cost saving, because they are easily quantifiable, and "soft" savings resulting from indirect benefits such as improved constructability or productivity (Jergeas 1999 cited Hiley and Paliokostas 2001). Barton et al. (1999), Norton and McElligot (1995), OGC Guide (2007) have explained the benefits that can be derived by using VM. Those are: Provides a forum for concerned parties in a project development. Provides an authoritative review of the entire project, not just the few elements Identifies project constraints, issues and problems which might not otherwise have been identified Deals with lifecycle not just initial, costs Usually results in remedying project deficiencies and omissions and superfluous items Identifies and removes unnecessary costs Provides a means to identify and incorporate project enhancements Crystallizes an organization's brief or project priorities Provides management with the information it needs to make informed decisions Permits a large return on a minimal investment

2. 2. 4 Value Management Process

In general, the whole VM workshop is normally undertaken in three stages over a period of time: a pre-study stage, a value study stage, and a post-study stage. The systematic job plan in VM was developed by Miles in 1961,

which was popularly known as VE and was further explored and developed to enhance the use of VM. The Society of American Value Engineers or SAVE International published its own job plan in 1997 while Male et al. (1998) have their own as well (Berawiet al. 2007). The similarity between Miles procedure and SAVE International's procedure is that both have three phases. The ' Pre-study Phase' by SAVE International is a development of the orientation and information phases by Miles. The same applies to the Value Study Phase and Post-study Phase, which might be developed from Miles' procedure. On the other hand, Male et al.(1998) proposes six phase procedures of VM where there are interconnections and similarities of the procedures with SAVE International. Instead of having one value study phase as developed by SAVE International, which comprises of several steps in the procedure, Male et al. has divided the phase into Creativity, Evaluation and Development phases. The differences of job plan phases are as shown in Table 2. 2. Table 2 - Job Plan Procedure(Source - Berawi et al. 2007)

Lawrence D. Miles (1961)

SAVE International

(1997)

Male et al.(1998)

Orientation
Information
Pre-study Phase
Pre-study

Phase
Speculation
Analysis
Programme planning
Programme

execution
Status
Value Study Phase
Information Phase
Creativity

Phase
Evaluation Phase
Development Phase
Summary & Conclusion
Post-study

Phase
Consensus Phase
Addition to the Male's plan, Norton and McElligot

(1995), Leung and Chu (2003), Othman (2008) all have included "

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Presentation/Recommendation" phase as a sixth phase. Each and every job plan phases and procedures and activities under the phases are clearly explained by Norton and McElligot (1995), and Othman (2008) as below:

2. 2. 4. 1 Pre-Study Phase

The objective of the pre-study phase is to ensure that all parties are well coordinated, the study is properly targeted and there is sufficient information available for the actual study. The activities that occur during this phase include: orientation meeting, finalizing the team structure, selecting the team members, deciding on study duration, determining study location and conditions, gathering information, site visit, cost estimate verification, preparation of models and efficiency data (Norton and McElligot 1995).

2. 2. 4. 2 Study or Workshop Phase

During this phase the Multi-disciplinary team is mobilized to conduct the VM study following the procedure set down in the five-step job plan subsequently described. The team structure is tailored to suit the particular project type, but generally includes a VM Team Coordinator (VMTC), relevant design engineer, operation experts, quantity surveyor and customer representative. Where constructability issues are of concern a construction manager may participate. The optimal size is generally recognized to be between six to twelve members, overlay large teams should be avoided. The duration of the study depends on the nature and size of the project and the stages at which the study is conducted (Norton and McElligot 1995).

Information Phase

This phase aims to establish a good understanding of the project in terms of: its function, constituent elements, design, operation plan and areas with the greatest potential for saving and needed improvements. To that end, the workshop generally starts with an overview of the activities, which will occur within during the VM process by the value specialist. This will be followed by design presentation from the design team. These activities are followed by the function analysis part of the information phase. Function analysis is intended to assure that every VM team member fully understands all of the project's functional requirements, not just his or her own area of specialty: first by examining the total project and then each of its component elements, to identify their basic and secondary functions (Othman 2008).

Creativity Phase

According to Othman (2008), this phase aims to generate innovative alternative ideas to achieve the same basic functions at lower costs or to achieve necessary improvements. The most often used method is the brainstorming technique, which consists of VM team generating and recording a large number of ideas without evaluation, (idea evaluation is performed in the evaluation phase).

Evaluation Phase

Various evaluation methods may be used during this phase to analyze and highlight the best ideas generated during the creativity phase. These ideas are evaluated, both on economic and non-economic criteria such as aesthetics, environmental impact, etc (Norton and McElligot 1995).

Development Phase

Othman (2008) stated that the ideas for alternatives selected during the evaluation phase are now developed into fully detailed proposals, which generally comprise: Description of both the original and the proposed design
A narrative on the advantages and disadvantages of each proposal
Initial and life cycle cost consequences of the proposals
Detailed technical calculations, sketches, etc. Proposals must be clearly detailed to help making prudent decisions.

Presentation Phase

Generally on the last day of the study, a presentation of the refined and developed proposals will be made to decision makers and other interested parties. The developed proposals will be summarized and the life cycle cost saving presented. The VM team members will explain the rationale behind each recommended proposal. Draft copies of summaries of the proposals may be handed over so that decision makers can immediately commence evaluation of the recommendations (Othman 2008).

2. 2. 4. 3 Post-study phase

Within five to ten working days a preliminary VM report may be submitted which will contain all the detailed proposals and summaries, narratives on the process and so on. Following an appropriate period for review, an implementation meeting should be held to determine whether proposals are to be accepted or rejected, and to establish subsequent actions (Norton and McElligot 1995).

2. 2. 5 State of Application of Value Management

A research conducted by Shen and Chung (2000 cited Shen et al. 2003) says that 50% of the value management users interviewed were not satisfied with current value management practices. Green (1999 Hiley and Paliokostas 2001) argues that the confused and inconsistent use of the terminology and the lack of a standard definition are barriers to its widespread use and also value management is associated with many misconceptions. Shen et al. (2003) stated there are main three reasons to the current status of value management. Those are (a) Lack of information, (b) Lack of participation and interaction, and (c) Difficulty of conducting evaluation and analysis. According to Ranasinghe (2000) and Navarupan (2004), Value Management is new to Sri Lanka, thus it is poorly used and the awareness of the technique is minimal among the professionals. Perera et al. (2003) stated that a main factor for the absence of value management in the Sri Lankan construction industry could be the greater fragmentation of the industry.

2. 3 Integration of Risk Management and Value Management

RM and VM in a planned and structured process could help the project team make the best decisions at the right time. Rather than perpetuating a process of 'adding things in because of risk' and 'taking them out because of value', it is suggested that the two techniques once put together will eliminate the constant recycling of ideas (Ellis et al. 2004). Further he argues that pressure from clients to deliver VM and RM in less time is the real driving force for integration. Griffin (2006 cited Berawiet et al. 2007) argues that the issue is no longer about whether they should be used but whether

the processes should be integrated. Furthermore, OGC (2003 cited Berawiet al. 2007) mentioned that VM and RM are interrelated tasks that should be carried out in parallel. The application of VM will help client to identify the best way of meeting business need while RM is used to manage the risks associated with the solution that offers the best whole-life value to the business and should not be seen as barrier to innovation. A lot of similar processes can be found in both RM and VM practices, thus it is important to compare those practices.

2.3.1 Comparison of RM and VM

Hiley and Paliokostas (2001) stated that, VM and RM are group activities based on systematic processes and utilize multidisciplinary teams in creative workshops. VM is a means of defining project objectives whilst RM ensures that they are not affected by future, uncertain events. VM needs creativity in order to generate options which meet required functions, whilst RM requires creativity when identifying and responding to potential risks. A common technique used in both is brainstorming. Both techniques bring value to a project. VM enhances value by clarifying objectives, establishing good communication and preventing conflicts. VE promotes the elimination of unnecessary cost and as a consequence adds value to the project. Further Hiley and Paliokostas (2001) argue that proactive RM adds value to a project by ensuring that project risks are prevented, reduced or managed efficiently. It may be argued that VM and RM are fundamentally disparate in that they require a different mindset: VM may be thought of as requiring a positive approach, with RM requiring a negative frame of mind. However in RM, the negative phase can be said to be limited to the Risk Identification stage. The

Risk Response stage requires a positive mindset in order to identify the means by which the situation may be improved. Both techniques improve decision making and have a lot of common aspects.

2. 3. 2 Similarities in VM and RM

Whilst the processes of VM and RM may differ in detail, they have several common components. Dallas (2006) listed the common components as: The preparation stage, to understand the project and the issues relating to itThe requirement for consultation with and involvement of the main stakeholders. The use of facilitated workshops involving a balance of stakeholders, disciplines and charactersThe development of value and risk profiles by which progress towards improving value and reducing risk may be assessedThe development of proposals to improve the project and management actions to implement themThe need for an explicit implementation planThe written record, or report on the outcome, providing a clear audit trail. The need for regular reviews to monitor implementation and report progress. Alignment of formal reviews with key milestones or gateways

2. 3. 3 Argument for Integration of RM and VM

Hiley and Paliokostas (2001) VM and RM are two well-established disciplines recognized as a part of best practice. The links between them are strong. In RM when a risk is managed it is possible to achieve a cost saving and an enhancement in value. In VM when options are considered there may be risks associated with each proposal. RM and VM appear to be both compatible and complementary and therefore it is logical to argue that the potential for a common framework should be investigated. Norton and <https://assignbuster.com/vm-was-originated-in-the-general-electric-construction-essay/>

McElligott (1995) suggest that RM may be enhanced by VM, using the VM team to either audit or produce a project's RM plan. In a combined approach there is potential to benefit from the assembled multidisciplinary team and also to promote the introduction of RM into an organization (Connaughton and Green 1996 cited Hiley and Paliokostas 2001). Since RM is mainly perceived as a negative process a combined approach could mean that advantage could be taken of the creative, positive atmosphere of a VM study to generate ideas to mitigate risks or identify opportunities.

2. 3. 4 Need for Integration of RM and VM

Scholars and researchers in VM and RM (Connaughton& Green 1996; Paliokostas 2000; Smith et al. 2006; Thompson 2004; cited Berawiet al. 2007) have provided reasons why there is a need to integrate between VM and RM is as follows: Utilization of the same resources/ multi-disciplinary team hence avoiding duplication of effort Involvement of stakeholders in the workshops Good way of introducing VM and RM into an organization Maintain and improve future appraisals and assessment of projects Influences the VM proceeds in this case-option appraisal, by allowing the users to consider specific options used in the past similar projects Makes them aware of their weaknesses and strengths Shortening the time taken to develop viable solutions based on the risks facing a project Identifies specific risk allocation structures in association to contract strategies Provides in-depth assessment process

2. 3. 5 Benefits by the Integration of VM and RM

Othman (2008) and Kirk (1995) have explained the benefits of the integrated RM and VM as follows;
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The risk analysis results in the VA Team " Value engineering" the risks.

The traditional VE workshop usually identifies the cost of a project in terms of the calculation of the deterministic cost of the line items of the elements analyzed. Most of these costs are the " above the line" construction or production costs, very often there is no consideration, or for that matter, a method of calculating the cost of risk. However, in the integrated process, alternatives are analyzed in terms of " worst case/best case" scenarios. With then, in turn, affect the project contingency. The project contingency calculated using risk analysis techniques can thus define, in a quantitative way, substantial cost avoidance and potential project cost savings.

The integrated VM and RM programme enables definitive value analysis of subjective, difficult to quantify elements.

Integrated process gives the ability to quantify qualitative elements, such as the quality of design, the level of detail in contract documents, bid-ability, constructability, contractor response, and other soft areas of analysis.

Better Understanding of the Customer Needs and Requirements

VM and RM are total customers driven techniques directed towards understanding the customer objectives, establishing their value system, identifying, analyzing and responding to the different risks that affect and hinder the achievement of customer objectives. In addition, the project brief could be improved through refining requirements, analyzing functions and feeding back for future projects

Removing Unnecessary Cost

Application of VM and RM helps (a) achieving optimum value for money in satisfying a range of customer's requirements, (b) preventing unnecessary expenditure, (c) achieving balance between cost and function, (d) using substitute materials, (e) reviewing design at key points, (f) improving Life Cost Cycling, (g) avoiding over specification and (h) conserving energy.

Reducing Project Time

This could be achieved through (a) simplifying project design and construction method, (b) managing risks that may delay the project completion and (c) using standard elements.

Improving Communication and Team Working

The diversity of workshop team members represents a cornerstone for successful results. Representing all project stakeholders ensures that their views, objectives and requirements are well perceived and adequately reflected in design and construction. In addition, their participation in the decision making process emphasizes their commitment to implement the selected decision. In addition, application of VM and RM principles helps escalating employees' enthusiasm and enhancing skills through team participation and improving communication between stakeholders.

Creative, Challenged and Innovative Ideas

VM and RM are based on systematic steps which ensure that the problem in hand is thoroughly studied, innovative alternatives are generated and evaluated, best alternatives are selected and implemented. This helps getting better confidence in developed solutions, accelerating the

incorporation of new materials and construction techniques, carrying out continual improvement of standards and policies and challenging traditional working processes and procedures.

Managing Change Orders Effectively

VM and RM have different opportunities to be applied throughout the project life cycle in order to achieve best value for money and manage associated risks. These opportunities are at: (a) Conception formulation, (b) Design tentative, (c) Working Drawings, (d) Construction, and (e) Operation stages. This helps managing change orders that may take place during the design and construction stages and helps responding effectively to the drivers that may affect the project brief. So it is obvious that there is a need to investigate a common framework for integrated Value and Risk management.

2. 3. 6 Framework for Integrated Value and Risk Management (VRM)

OGC (2007) introduced a gateway process for the integrated VRM methodology. The Gateway process helps to reduce overall project risk and increase the value by examining the project at critical stages in its lifecycle. Berawi (2007) stated that, in undertaking VM workshop, it is beneficial that the aspect of risks are taken into consideration into the phases of job plan, to achieve project objectives - as this allows potential risks to be identified, analyzed and appropriate responses to be taken for each items and options. Kirk (1995) proposes the risk activities for each item under consideration during the job plan phases while Thompson (2004) provides the general risk considerations to the project under study. By integrating both activities, it

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may become a very strong and useful combination of risk analysis and management in a value studies. The extent to which any risk analysis is carried out during a value study should be down to the judgment of those involved in the study to achieve the most appropriate results. Framework suggested by Kirk and Thompson is mentioned in Table 2. 3. Table 2 - Risk considerations and activities in VM Job plan(Source - Berawi et al. 2007)Hiley and Paliokostas (2001) argues that, both VM and RM services are considered an additional cost, time consuming and clients are often unaware of their benefits. Their integration could overcome this problem by offering a combined efficient service and therefore help these disciplines achieve the recognition they deserve in the industry.

2. 7 Summary

RM enables the delivery of programmes of work and projects on time, meeting the budget, quality and performance requirements, as well as increasing profit and return on investment. VM provides a structured approach to the definition and delivery of value for money. The processes aim to resolve ambiguity and establish a shared commitment to a common set of objectives. Although professionals strongly acknowledge the application of VM and RM, in current practice they are rarely used due to several reasons. The potential to integrate VM and RM services is recognized by all, although such integration is yet to be fully developed and implemented. But the question is " is the integration of VM and RM practical or desirable?" Thus there is a greater significance to examine applicability of integrated Value and risk methodology.