

VALUE MANAGEMENT – THE WAY FORWARD

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ABSTRACT: The article aimed to provide the readers the basic understanding of Value Management Methodology. It presents the general background, some historical development, concepts, issues commonly practice in the managing construction projects. It also provides some abstracts of cases that have gone through the Value Management process. The article also highlights the concept of Value Management Change Proposal (VMCP).

KEY WORDS: Value Management (VM), History, Concept, Cases, Value Management Change Proposal (VMCP).

1.0 INTRODUCTION

Value Management is a structured, analytical process for developing innovative holistic solutions to complex problems. It involves representatives of key stakeholders in facilitated workshop (New South Wales Department of Public Works and Services 1997). The structured functional analysis is very significant during the application of Value Management Methodology in achieving the cost optimization and better value for projects.

According to Dell I'sola (1997), value is defined as the most cost effective way to reliably accomplish a function that will meet the user's needs, desires and expectations. The fundamental contribution by the Value Management technique is to eliminate the unnecessary cost which does not contribute to the value of the services, products, systems and that obviously includes the construction projects.

2.0 HISTORICAL BACKGROUND OF VALUE MANAGEMENT

Value Management originated in the United States emerging resulted from components and materials shortage in the manufacturing sector during World War Two. Mr. Lawrence Miles (The Founder of Value Management, then known as Value Analysis) of The General Electric Company was greatly responsible for the establishment of the

technique in 1942 and since then the technique is very much accepted in various industries. Presently United States Government and many other nations such as United Kingdom, Japan, Korea, Australia, Saudi Arabia amongst others adopt Value Management technique to be applied for their Capital work projects.

In Malaysia, to the best of Author's knowledge, Value Management was formally introduced in 1986 by Assoc. Professor Roy Barton from Canberra University, Australia to the Quantity Surveying Department in the Universiti Teknologi Malaysia (UTM). The author was privileged to be one of the participants in that Value Management training program.

There comes a time in history when the events should be told "Like it is". Here it is. Jaapar, A., J.B. Torrance, et al. (2004) recorded the following events:

In year 1990, Barton made another subsequent visit to Malaysia. Together with Mohd Mazlan Che Mat, he went to the Petronas, The Ministry of Defense as well as to private companies to introduce Value Management concept to the organisations. Seminars were also arranged to disseminate the knowledge and to create awareness to the Value Management concept.

Since the method of Value Management emphasized on the increased awareness to achieve value for money, which could benefit the local construction industry, the idea to adopt the technique was taken seriously by one of the academics, Mohd Mazlan, who then made a study visit to Australia in the year 1990 in order to take a closer look into the Value Management Methodology and its implementation process under the sponsorship of the Commonwealth Science Council.

Later a consultation team dedicated to Value Management application and facilitation was offered by the Department of Quantity Surveying, Faculty of Built Environment, and later the team moved to the Innovation and Consultancy Biro of UTM and later under UNI Technologies Sdn Bhd (wholly own company by UTM) led by Mohd Mazlan to advice and service the local construction and manufacturing industry and at the same time to spread the awareness towards Value Management. A few Value Management studies were conducted successfully by the team (Che Mat 1999).

During the same year of 1999, the first National Seminar on Value Management was organized by IKRAM, JKR, officiated by Tun Daim Zainudin, then Minister of Finance Malaysia. In his opening speech, he strongly suggested the industry to take up Value Management on board due to the benefits offered by the concept. {The Author was the only speaker for the two day seminar}.

In the same year, to ensure that the construction industry and its public aware towards the concept and benefits of Value Management, Mohd Mazlan went to 5 states, Penang, Johor, Kuala Lumpur, Sabah and Kuala Terengganu and later went to Brunei to

disseminate the Value Management knowledge by giving seminars and talks to the related organizations.

Value Management subject was taught at some of the major public universities such as Housing, Building and Planning, Universiti Sains Malaysia (USM), 1991, Department of Quantity Surveying, Universiti Teknologi Malaysia (UTM), 1993/1994, Universiti Malaya (UM), 1996, The Faculty of Architecture, Planning and Surveying, Universiti Teknologi MARA (UiTM), 1997, Universiti Islam Antarabangsa (UIA), 2000, Polytechnic, 2003 among others and other Private Institutions.

Due to the positive response from the construction and manufacturing industries, in May 2000, the Institute of Value Management of Malaysia (IVMM) was registered and formalized with 20 founding members. Currently the membership of the Institute has grown to 210 members. The immediate function of the institute is to promote the value culture into the country to the public and private sectors as well as to create a widespread awareness to the community of the benefits to be derived from the application of Value Management in Malaysia.

3.0 DEFINITIONS AND CONCEPT OF VALUE MANAGEMENT

3.1 Concept of Value Management

Miles in the original context of Value Management then called Value Analysis defined as “*philosophy implemented by the used of the specific of techniques, a body of knowledge, and a group of learned skills*”. **Dell I’sola (1982)** later simplified the definition as “*the creative organized approach whose objective is to optimize and/or performance of a facility or system.*” **Che Mat, M.M.(2004)** defined Value Management (VM) as a rigorous, systematic and innovative methodology with multi disciplinary approach to achieve better value for projects, products, facilities and systems without sacrificing the required performance level. It is a creative way of working together in achieving client and stakeholder’s requirements.

Conventionally, there seems to be fragmented efforts by the clients, project managers, architects, engineers, quantity surveyors and owners in realising the proposed projects. In many cases, the parties involved in the planning and design development tend to work in ‘**silos**’. Value Management provides a very effective tool to integrate this diverse discipline and parties to work on a common goals and adopting a very structured methodology. There are a lot of cross-functional discussions and enhancing communications and a lot of better understanding with regards to required performance level of projects under study. This is illustrated in the figure 1.

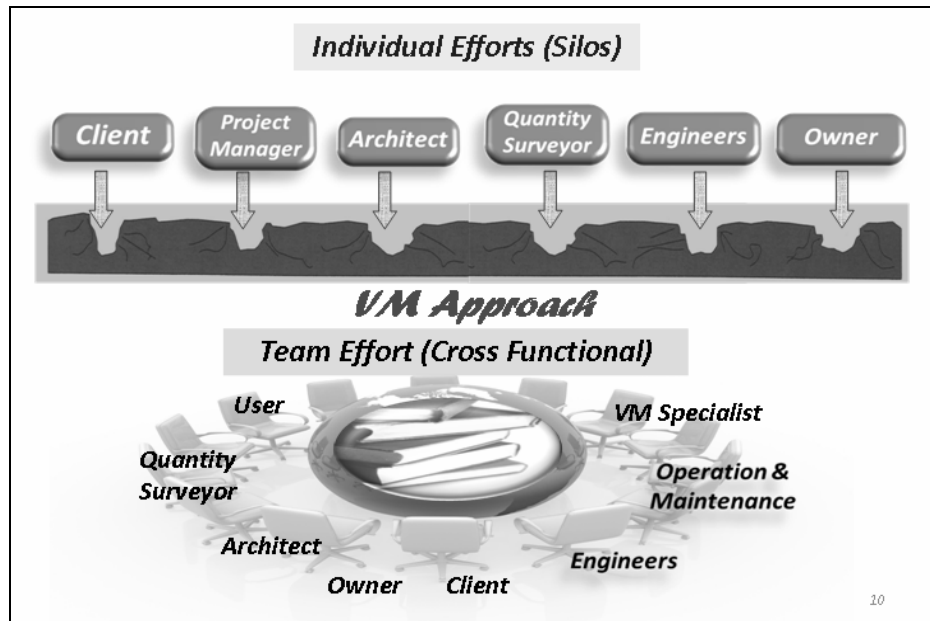


Figure 1: The Conventional Approach vs the VM Approach

Value Management has been defined in other number of ways such as:

- Kelly and Male (1991) define Value Management as an oriented effort to attain optimum value in product, system or services by providing the necessary functions at the lowest cost.
- Australia's Department of Defence, reference book DRB 37 defines Value Management as *"the systematic effort directed at identifying the functions of systems, equipments, facilities, procedures and supplies for the purpose of achieving the essential functions at the lowest cost consistent with the needed purpose, performance, reliability and maintainability."*

Kelly and Male (1991) characterized Value Management by being:

- Systems oriented - uses a formal job plan and remove unnecessary costs.
- A multi-disciplinary team approach – teams of experienced designers, estimators and Value Management Consultants.
- Life cycle oriented - examines the total costs of owning and operating a facility
- A proven management technique
- Function orientated – relates functions required to the value received.

Bone and Law (2000) identified ten mandatory characteristics of Value Management practice:

1. It is visibly supported by senior management.
2. It generates a clear program of work.
3. It involves structured team-based workshops.
4. It employs a range of analytical tools.
5. It involves creative brainstorming.
6. It is led by a qualified value practitioner.
7. It follows a structured 'Job Plan'.
8. It involves customers.
9. It involves suppliers.
10. It causes study terms to achieve sustained improvements.

According to Dell I'sola, the relationship between Value, Function (Worth), Quality and Cost can be symbolized as follows:-

$$\text{Value} = \frac{\text{Function} + \text{Quality}}{\text{Cost}}$$

Where:

Function = The specific worth that a design/item must perform

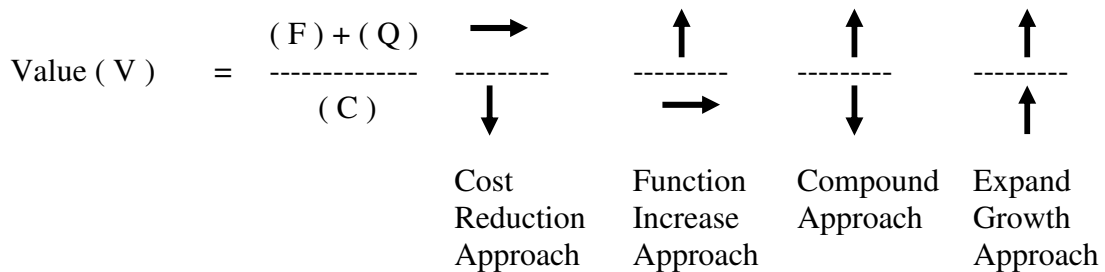
Quality = The owner's or user's needs, desires, and expectations

Cost = The life cycle cost of the product/project.

Therefore, we can say that:

Value = The most cost effective way to reliably accomplish a function that will meet the user needs, desires and expectations.

As such, value can be increased by the following approaches:



At the core of Value Management process is the analysis of functions of the system as a whole

3.2 Function Analysis

Function Analysis involves clearly identifying what things actually do, or what they must do to achieve the project objectives. Through the analysis of functions, it is possible to identify the wastage, duplication and unnecessary expenditure thus providing the opportunity for value to be improved. The function analysis perspective not only enables Value Management to explore the project and /or program brief but also test the assumption and needs perceived by the author of the brief.

4.0 VALUE MANAGEMENT JOB PLAN

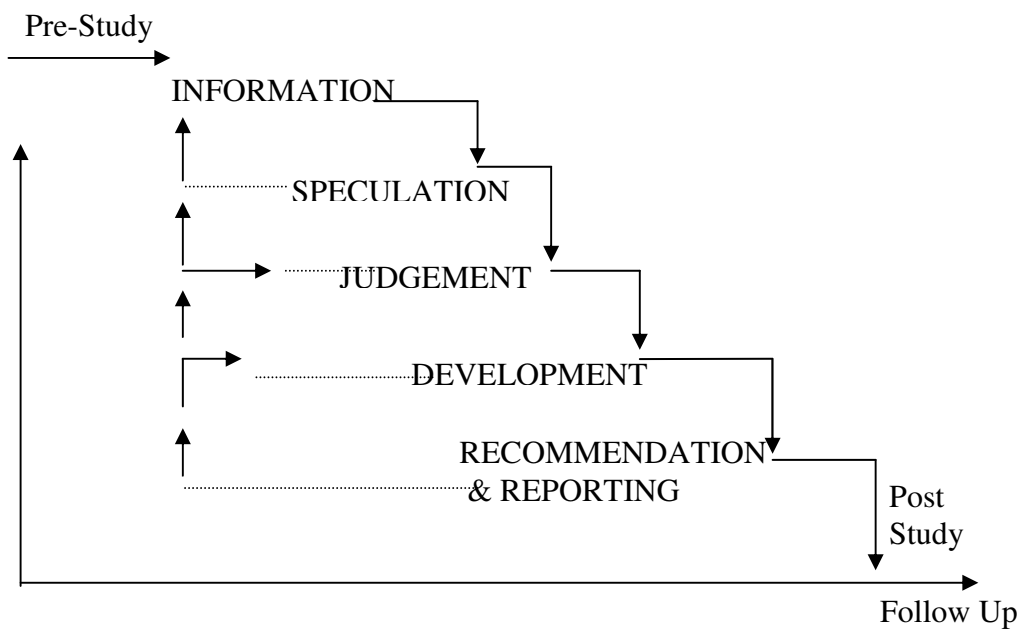


Figure 2 - Five steps of the Value Management Job Plan

The five steps of the Job Plan are shown diagrammatically in figure 2 above. The significant of the arrows is that, whilst a cascade system is used, with each phase flowing on from and using the output of the preceding phase, there is frequently reversion to a previous phase, as a result of some discovery or unexpected development.

Value Management Study

4.1 Pre-study Preparation

Discussions with the project client prior to the actual workshop is very important so that each party to the study has a clear understanding of how and why a Value Management study is conducted and make known to them of their required input.

4.2 Value Management Workshop

a) Information Phase

The information phase is the beginning of the Job Plan and understanding the decisions that have influenced the development of the project design is crucial. Designers are to present an oral overview of the project. Function Analysis is established and in many instances Function Analysis System Techniques are developed.

b) Speculation Phase

The information phase of Value Management study never ends as it keeps on adding as the study progresses. The Value Management team then accomplishes the creativity phase to generate as many ideas as possible.

c) Judgement Phase

Ideas generated from the creative phase are then judged as to their merits and demerits. Ideas found impractical and to be irrelevant or not worthy of additional study are disregarded. Those ideas that have potential for cost savings or improvements to the project are then developed further.

d) Development Phase

The ideas that have been evaluated and selected earlier are expanded into workable solutions. Alternative design sketches and illustrations are prepared whenever necessary. The alternative proposal is estimated preferably its life cycle cost that includes not only initial cost but operation and maintenance during its economic life span. Although each job plan phase has specific items that must be accomplished and specific cut off time and dates it does not mean that the job plan is not flexible. It may be necessary, after receiving new information, to revert back to the earlier phases of the job plan to gain information or brainstorm new ideas.

e) Recommendation and Reporting Phase

The functions of the recommendation and reporting phase are to sell recommendations, Incite action and convey information.

4.3 The Post Study

Upon the completion of the Value Management Workshop, the report need to be prepared capturing the information gathered, ideas that have been generated, evaluated and developed in the Value Management Workshop. The list of action plan also became important content in the Value Management Report. In many instances, the Value Management Director is requested to make presentation to the Top Management of the client's organization.

5.0 WHY TO APPLY VALUE MANAGEMENT

Despite increased recognition of Value Management's benefit and marked level of success worldwide. Its full potential is yet to be realized especially in Malaysia. Like many other techniques or disciplines that have to undergo the stage of awareness prior to public recognition, Value Management is essential. Among significant contributions and potentials of Value Management are:

i. Value Management Promote Systems Thinking

Prof. Roy Barton strongly advocates the concept of Value Management as a tool for systems thinking , to look things in a broader perspective rather that just the brick and the mortar issue.

In one study on the condominium development that involved the author, the designer proposed the floor to ceiling height of 10'0". After being asked what is the purposed and function of that, they responded that it was for marketing purposed, which was than disputed by marketing guys. The Building Bye-Laws only requires 8'6" floor to ceiling height. However it was then decided to go for 9'0" in height. The purposed building was 12 storey of 12 blocks. There was a saving of RM1.0 Million per block with the overall saving of RM12.0 Million.

ii. Establishing Customer Needs

The function analysis allow us to establish customer needs as we can identify those needs due to the participate nature of the Value Management study. Those needs statement can also be priorities and set the direction to achieve those needs.

iii. Value Management Change Proposal (incentive clause)

Australian Department of Defence incorporate the incentive in their procurement contract where the contractor is allowed to offer alternative proposal to the components through Value Management Charge Proposal Programme, but not compromising on the quality nor function. The saving will be share between the contractor and the client on certain agreed terms.

iv. Staff Development

Team Building is promoted during the Value Management study and as such it is an important staff development exercise as every participant feels that his needs and ideas generated are noted and discussed. They also learn to work under certain pressure as the deadline for the submission of the report has to be met. The satisfaction is felt due to the saving as a result of Value Management study which they participate.

v. Partnering

Ted Smithies (1993) in his article "Partnering- An Extension of the Value Management Process" described the Partnering concept is a way of overcoming the traditional adversarial and litigious nature of the construction industry. It is a process for improving relationships among those involved on a construction project to the benefit of all. Partnering uses structured procedures involving all project participants to:

- define mutual goals
- important communication; and
- develop formal problem solving and dispute resolution strategies.

The immediately obvious common areas are that both structured, systematic and focus on a workshop as a prime means of facilitation. Furthermore, Partnering is based on the fundamental human value concepts of common sense, trust and commitment, which all practitioners would doubtless see as vital to the success of Value Management.

vi. Vehicle for change

One of the most important aspect of Value Management study is to generate as many ideas as possible and the creation of new an innovation methods. Change is an essential aspect in today's and future business success. Due to holistic and participatory in any organization will not be much disrupted as the various levels of staff are involved in creating change to be more competitive.

vii. Identifying and Removing Unnecessary Costs

One of the objectives of Value Management is to eliminate unnecessary costs without reducing reliability and saleability.

Other benefits of applying Value Management are:

- Solve immediate and high priority problems
- Establish low cost goals
- Identify and define stakeholders aims and objectives
- Optimize the unit/component cost
- Produce unique solutions
- Increase the marketing potentials

- Improved communication
- Improved quality
- Reduced time
- Reduced commercial risks
- Helps to increase the co-operation between departments
- Encourages fresh thinking
- Spreads cost-consciousness
- Develops hidden abilities
- Helps to provide better appreciation of the ‘other man’s job

6.0 WHEN TO APPLY VALUE MANAGEMENT

Value Management studies can take place at any stage in the development of a project. However it is acknowledged that there is the potential for greater return on investment if it is used at the very clear stages illustrated in figure 3 and 4 below.

As such Value Management should be performed as early as possible even before the commitment of funds, approval of systems or design as to maximize results.

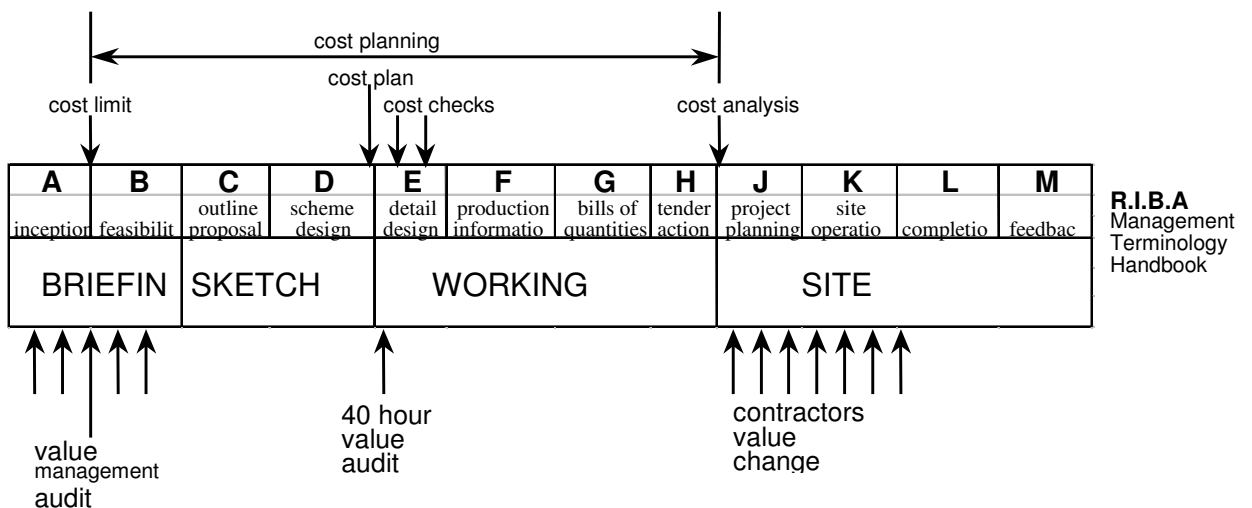


Figure 3 - The Application of Cost Planning & Value
 Source: Kelly JR & Male SP (1991), *The Price Of Value Management & Enhancing Value or Cutting Cost*,
 The Royal Institution of Chartered Surveyors

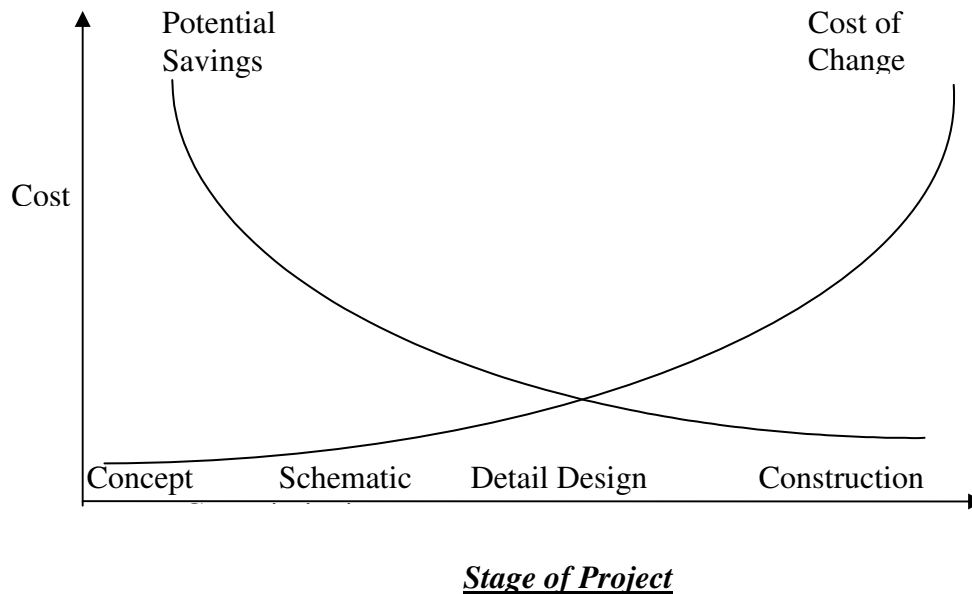


Figure 4 – Stage of Project and Savings Potential

The cost of making changes and remedial works will be greatly increased later in the development stage.

Assuming the project is already committed the Main Contractor has already been engaged and then the client decides to review the design by using Value Management technique, some recommendation are put forward resulting in variation orders that leads to the possible loss and expenses claim by the Contractors and abortive fee claim by the Consultants

There is no fixed rule concerning the Value Management study duration, however the 40-hour workshop is well-established duration. In Australia and New Zealand a two-day Value Management study for during conceptual proposal is widely used.

7.0 ABSTRACT OF CASES

7.1 Institut Aminuddin Baki (IAB) Sarawak Branch

Economic Planning Unit (EPU) has approved the budget of RM237.5 million to Ministry of Education to undertake the development of IAB Sarawak Branch. The aim of the project was to enhance the quality of leaderships of school headmasters and their deputies.

The earlier design was based on enhancing the skills of leadership. This major difference in understanding the real purpose of the existence of the IAB led to different interpretation and design philosophy. The abstract of the case is as below. Comparisons were made before and after VM study.

Table 1: Summary of VM Study for IAB Project

Phase	Before (RM m)	After (RM m)	Saving / Extra (RM m)	%
Ceiling	237.5			
Std & Cost Recom.	237.5			
VM Study		172.2	65.3	27.5
VM Post Study (Follow Up)		161.1	11.1	6.4
OVERALL SAVING (from Original Estimate Prior to VM Study) 45 ideas were generated			76.4	32.2

7.2 Further Examples of VM Case Studies

Table 2: VM Case Studies

No	Project	Cost before VM	Cost after VM	Saving (%)	Remarks
1	Pakej 3/1A : Jalan Simpang Pulai – Lojing - Gua Musang – Kuala Berang	RM112.8 M	RM108.5 M	3.8	More effective design (Safety, Environmental & Maintenance requirement)
2	Klinik Kesihatan Jenis 3	RM6.8 M	RM6.45 M	5.1	More Effective Design (fulfilled User requirements)
3	Education Faculty for UTM	RM35 M	RM7 M	80.0	Effective Planning of Space & Layout to fulfill customer requirements
4	Library for USM, Penang	RM24.9 M	RM11.9 M	52.2	Effective Planning of Space to suit Site Provided to customer requirements

5	Darul Ridzuan Islamic College, Perak	RM120 M	RM57 M	52.5	Effective Planning of Layout and Design to customer requirements
6	High End Apartment Project	RM 42.9 M	RM 38.5 M	10.2	Improve ROI of 14.7% from 4.81% to 19.5% and Gross profit from RM2.2 M to RM9.3M
7	Projek Jalanraya Simpang Pulai – Lojing - Gua Musang - Kuala Berang (Pakej 8)	RM92 M	RM74 M	19.6	Identified many areas in the existing solutions where value improvements can be made without loss of functions
8	Utilities Mapping Development	RM2.5 M	RM1.74 M	30.4	Scrutinise and optimise the proposed project cost through identifying critical areas only

8.0 VALUE MANAGEMENT CHANGE PROPOSAL

8.1 What is VMCP?

For over four decades, the VMCP has had a notable history as an effective savings program for the US Government. The purpose of the VMCP program in the US Department of Defence (2004) is to incentivize the contractor to propose contract modifications which reduce cost without reducing product or process performance. Two aspects of the VMCP make it unique in achieving its purpose: the requirement that the VMCP results in a contract modification, and an incentive paid to the contractor for reducing costs.

A VMCP is a proposal submitted by a contractor related to the government, client or private employer after the contract has been awarded to that contractor, provided their contract contains a VM/VE clause.

A VMCP is a contractual mechanism provided by the U.S Federal, State, and private businesses. It gives a financial incentive to get contractors and subcontractors to reduce the cost of projects, systems, supplies, and services for contracts in-progress.

To qualify as a VMCP, a proposal must, at a minimum, require a change to a contract to implement, and save money. It must lower the overall cost without degrading performance, reliability, maintenance, or safety.

The Michigan Department of Transportation (2003) highlighted that a VMCP modifying plans, specifications, or other contract requirements can be submitted for a project if the proposed change results in reduced construction cost, a higher quality product, improved safety, or a shorter contract time. The proposed change must not alter the essential functions or characteristics of the project or significantly delay the completion of the project. Essential functions and characteristics include, but are not limited to, service life, operating costs, ease of maintenance, desired appearance, impact on utilities and right of way, and design and safety standards. The provision does not restrict the contractor from proposing improvements to the project that may not result in net cost savings but may add functionality. A conceptual VMCP stating the basic concept and approximate cost savings may be submitted for preliminary consideration.

According to SAVE (1995), VMCP is the formal technique by which a contractor can either:

- a. Voluntarily suggest methods for performing more economically and share in the resulting savings or
- b. Are required to establish a program to identify and submit to the Government methods for performing more economically.

The proposal packages prepared and submitted by the Contractor, in the Central Artery/Tunnel Project which was a program sponsored jointly by the U.S. Federal Highway Administration and The Massachusetts Turnpike Authority was to recommend cost – reducing, function – and value – retaining alternatives to the design specified in its conformed contract. The net savings were determined by deducting contractor VMCP development and implementation costs, and the review and processing cost incurred by the client from the VMCP's total gross savings value. VMCP savings applied only to the contract in effect at the time the proposal was submitted. Net savings did not apply to subsequent changes in the contract, or to other contracts.

8.2 Value Management Incentive Clause

The Department of Defence of the US government introduced the Value Incentive Clause for suppliers' contract in October 1964 (Standing, 2001). Its acceptance provides the inputs for the Value Engineering's wider use, particularly in the field of construction (Standing, 2001).

The Value Management Incentive Clause (VMIC) is the incentive clause that can be provided in Malaysia for procurement contracts, such as PWD 203A/203, PAM, FIDIC Form of Contract etc., whereby the Contractor is allowed to offer alternative proposals to the government components through a VMCP. An example of the inclusion of a VM incentive clause is in the latest FIDIC Form of Contract (2002), Clause 13.2, which incorporates the Value Engineering Clause that caters for VMCP proposal illustrated in Figure 2.

8.3 Why Do They Include This Clause in Their Contracts?

After contract award, there is little reason for the contractor to reduce acquisition or life-cycle cost. Since profits are derived from the contract cost, reducing that cost should reduce the expected profit. The VM/VE Incentive Clause dramatically changes this situation. It allows the contractor to increase their profit by sharing the net savings in four areas: their instant contract, concurrent contracts, future contracts (usually limited to a duration of three years in the future), and collateral (maintenance, operations, and support) savings. Exact shares are defined in the regulations implementing the clause.

VMIC can be used to persuade Contractors to offer creative ideas for the benefit of the company. To increase innovation and take advantage of the ideas from contractors, several things are required as below:

- a. Easy rules to follow
- b. An infrastructure to act on the ideas
- c. Incentive for the ideas
- d. Policy, rules or procedures for the ideas.

FIDIC Form of Contract (Extract)

CLAUSE 13.2: Value Engineering

The Contractor may, at any time, submit to the Project Manager a written proposal which (in the Contractor's opinion) will, if adopted, (i) accelerate completion, (ii) reduce the cost to the Employer of executing, maintaining or operating the Works, (iii) improve the efficiency or value to the Employer of the completed Works, or (iv) otherwise be of benefit to the Employer.

The proposal shall be prepared at the cost of the Contractor and shall include the items listed in Sub-Clause 13.3 [*Variation Procedure*].

If a proposal, which is approved by the Project Manager, includes a change in the design of part of the Permanent Works, then unless otherwise agreed by both Parties:

- (a) the Contractor shall design this part,
- (b) sub-paragraphs (a) to (d) of Sub-Clause 4.1 [*Contractor's General Obligations*] shall apply, and
- (c) if this change results in a reduction in the contract value of this part, the Project Manager shall proceed in accordance with Sub-Clause 3.5 [*Determinations*] to agree or determine a fee, which shall be included in the Contract Price. This fee shall be half (50%) of the difference between the following amounts:
 - (i) such reduction in contract value, resulting from the change, excluding adjustments under Sub-Clause 13.7 [*Adjustments for Changes in Legislation*] and Sub-Clause 13.8 [*Adjustments for Changes in Cost*], and
 - (ii) the reduction (if any) in the value to the Employer of the varied works, taking account of any reductions in quality, anticipated life or operational efficiencies.

However, if amount (i) is less than amount (ii), there shall not be a fee.

Figure 4: FIDIC Form of Contract (Extract)

9.0 RECENT DEVELOPMENTS AND THE WAY FORWARD

Malaysia Airports Holdings Berhad (MAHB) and Tenaga National Bhd (TNB) have adopted Value Management as mandatory requirements for project above RM300,000 and RM10 million respectively. Both organizations have achieved remarkable success in optimizing cost for their projects, facilities and systems. Economic Planning Unit (EPU) of Prime Minister's Department, being the major Central Planning Agency is on the right track and committed in the implementation of Value Management.

Economic Planning Unit has developed guidelines on Value Management's application and Government has endorsed that any projects and programs of RM50 million and above must go through the process of Value Management.

In the meantime, The Institute of Value Management Malaysia has finalized the "Value Manager's Act 2010" and already submitted to The Economic Planning Unit (EPU) for their perusal and further action.

The Institute, together with Construction Industry Development Board (CIDB) already established an accreditation program for certifying the competent Value Management Practitioners as "Certified Value Managers".

10.0 CONCLUSION

Value Management has provided an effective way to deliver objectives and fulfill user's requirements and stood the test of time. The system based functional analysis of Value Management allows consideration of complex interrelationships. Consequently, Value Management has a broad range of applications, with principle opportunity of gains in the early stages of development of programs and projects. It is particularly useful in focusing or distilling objectives and priorities, and in generating alternative solutions.

Value Management provides a good platform for the members of the design team and stakeholders to discuss and solving the problems in the best possible manner and works best for the construction sector due to the nature of its activities that involve many disciplines and backgrounds. As a Professional, as a manager, no matter what our positions are, we have to be open, pro-active in our attitude to accept new things and value improvements as Miles once quoted "*habits take us where we were yesterday and attitudes keep us there*".

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