IS VALUE MANAGEMENT ACHIEVING VALUE FOR MONEY WITHOUT COMPROMISING THE QUALITY REQUIREMENTS?

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ABSTRACT

Value Management (VM) is regarded as a structured and systematic process for project stakeholders to undergo a value analysis with the aim to eliminate any unnecessary cost without compromising the quality of the project. However, many clients still see this approach as only a tick-the-box activity and many no longer understand its potentials for true value for money (VFM) savings. Some may even criticize that cost and quality are closely related and there is no optimum solution for both of them. Hence, the aim of this paper is to examine whether VM can achieve VFM for clients without compromising the quality requirements. Apart from review of relevant literature, questionnaires and interviews were conducted in South Australia with construction professionals who have experience in VM study in construction projects.

Based on the data collected, it has been identified that life-cycle costing (LCC) technique is the main key of success in achieving VFM. Majority of the respondents agreed that VM can achieve VFM without compromising the quality of the project. In addition, the evolving of VM team members in the initial stage of the design is essential to achieve functionality and operational effectiveness by meeting the core values of clients. Although cost saving can be achieved by eliminating unnecessary cost, there are practical constraints during the VM process. The attitude of the designers and the timing of VM workshops will definitely hinder its success.

Keywords: Value management, value for money, quality, South Australia.

INTRODUCTION

The application of Value Management (VM) may consider as one of the problem solving tools for the construction industry in achieving the 'best value' for money for the clients through the critical decision-making process by team members (Saifulnizam and Coffey, 2010). Implementation of VM at the early stage of a project will increase its potentials for cost saving and product quality improvement. Underlying

the Value Management theory is the principle that there is always more than one way to achieve project objectives and that examination of the alternatives will produce the most acceptable solution. Through the analysis of functions, wastage and unnecessary expenditure can be identified giving opportunity for value to be improved. (NSW VM Guidelines, 2004).

Clients often question the credibility of VM and its capability to provide satisfactory outcomes. According to the literature (Kelly, 2006; Leung et al., 2002), project satisfaction refers to the success of the project; which infers that satisfaction of client on VM is likely to be achieved when the outcome of the project has met their goals and objectives. In his research, Peters (2004) found that 95% of the clients and management team in South Australia were satisfied with the outcome of VM studies. In addition, the research has shown that 98% of clients who were satisfied with the outcomes of VM will re-employ this study on their next development.

According to Dell'Isola (1982), value is the most cost effective way to complete functions that fulfill the clients' objectives and benefits. The relationship between Values, Function (Worth), Quality and Cost can be formulated as follows (cited in Mazlan, 1999):

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

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

In VM, function analysis is the technique that differentiates the VM study from other management tools. The diagrammatic technique of the function analysis allows client and the project team members to systematically identify, make clear and evidently represent the client's requirements by asking the instinctive questions of **How, Why** and **When** to get to the heart of the problems faced in VM instead of circling around the problem without feasible solutions (Dallas, 2006; Dell'Isola, 1982).

ACHIEVING VALUE FOR MONEY (VFM)

Implementation of VM study can lead to improvement and innovation towards the initial target set by the client and team members. Effectiveness of VM has led to the higher cost savings in development. The exercise of VM is generally less than 1% of the total construction cost which has been mentioned by Macedo (1978). However, it can potentially help the client to save up to 5-10% of the total construction cost.

According to Dell'Isola (1982), there is an exemption that an organization may potentially develop a cost saving up to approximately 30% in a project by adopting the application of VM and function analysis (cited in Ng, 2006).

Figure 1 below indicates the cost impact of making changes over time. When VM study is implemented at the earlier stage of the development project, it potentially achieves higher cost savings through the reduction on unnecessary cost. Adversely, the delay of VM implementation would then limit and decrease the potential of cost savings (NSW Treasury Total Asset Management, 2004).

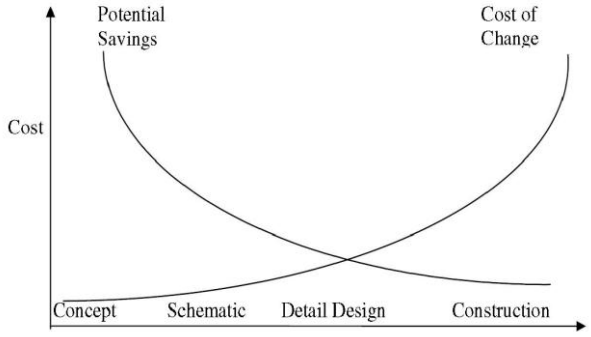

Figure 1: Stage of Project and Saving Potential (Source: Mazlan, 1999)

During the implementation of VM study, it is important for team members to fulfill client's requirements, as effective designs and spatial planning may lead to high cost savings for client. In some rare cases, the possibility of VM in cost savings may provide up to approximately 50 – 80% of the original cost as mentioned by Mazlan (1999). Apart from cost savings, VM aims to achieve operational and functional effectiveness of a project. Globally, VM has successfully delivered numerous projects with the best VFM to clients; however, there were also projects experiencing failure to achieve the end results. In particular, the North District Hospital of Hong Kong and the Fort McMurray School District project did not achieve costs saving in terms of time, quality, functional, operational and safety requirements. Table 1 below shows a summary example of VM case studies:

No	Authors	Nature of Project	VM achieved saving percentage	Remarks
1	Mazlan (1999)	Library for University Science of Malaysia (USM) Penang	52.2%	Effective Planning of Space to suit Site Provided to customer requirements.
2	Mazlan (1999)	Education Faculty for UTM (Malaysia)	80%	Effective planning of space & layout to fulfil customer requirements.
3	Mazlan (1999)	Health Clinic (Malaysia)	5.1%	Effective design
4	Pourhassan & Ma	Talvar Irrigation and	7.1%	Alternative Design

	(2009)	Drainage Network (Iran)		
5	Pourhassan & Ma (2009)	Sazbon Dam and Hydropower Plant (Iran)	22%	Explored different alternatives for execution.
6	Chan, Ma & Zuo (2006)	The North District Hospital of Hong Kong	-20%	VM exercise was carried out too late.
7	Clancy (2008)	Fort McMurray School District No.2933	-6.3%	Improve program performance by relocate certain facilities and expansion for certain areas.

Table 1: Case Studies on Value Management

Despite the capacity and proficiency of the designers, there are unnecessary hidden costs in the design. However, this phenomenon occurs mainly due to the nature of construction design that demands countless variables, meeting deadlines and other constraints to be considered. Unnecessary cost is unavoidable at the time when the designer is planning and detailing with his design under the burden of multiple constraints and requirements. The objective of VM study is to cut off these unnecessary costs to achieve VFM by providing quality works.

RESEARCH METHODOLOGY

Clients are increasingly demanding that the design team pay greater emphasis to the long-term cost effects of its design decisions. However, it is still debatable on whether VM is able to cut unnecessary costs without reducing the quality of the construction projects. Therefore, the aim of this paper attempts to answer whether the application of value management is achieving value for money without compromising the quality requirements. In order to answer this research question, questionnaire survey and interviews with the construction professionals are conducted.

Questionnaire survey

The survey participants were selected from different construction sectors in South Australia. A total of 82 survey forms were sent out and altogether there were 23 participants who responded. Table 2 below indicates the summary of responses:

Survey Questions	Response (No/ Percentages/ Mean)
Q1. (a) Familiarity of Value Management (VM) principles	
- Very Familiar	16
- Familiar	5
- Average	2
- Unfamiliar	0
(b) Number of times involved into the evaluation of building design	
- Never	1
- 1 to 5 times	3
- 5 to 10 times	3
- 10 to 15 times	2
- More than 15 times	14

Q2. Stage(s) of the project generally carried out the VM studies.	
- Feasibility	19%
- Conceptual Design	36%
- Detailed Design	21%
- Construction	17%
- Others	7%
Q3. Reason of the initial adoption of VM study	
- To achieve VFM	16
- Local competition that makes use of the practice	1
- Industry practice	4
- Request for the use of the practice from the project sponsors/ clients	12
- Others	8
Q4. Problems encountered when applying VM study	
- Client not wholly concerned with the budget	5
- Too late in the detailed design stage	13
- The attitude of designers	17
- Lack of coordination or cooperation	8
- Lack of knowledge and experience	5
- Others	8
Q5. Benefits of VM workshop	
- Improve VFM	4.55
- Time improvement	3.59
- Cost saving by eliminating unnecessary cost	4.45
- Provide a clear picture of project objectives	4.09
- Reduce commercial risk	3.73
- Improve the quality of the building	3.45
- Enhanced functionality	3.73
- Minimization of impact on environment/ local community	3.32
- Others	0
Q6. Level of cost saving by the implementation of VM	
- No saving	0%
- 0 to 5%	13%
- 5 to 10%	44%
- 10 to 20%	30%
- Other (20% above)	13%
Q7. Approach of VM generally applied	
- The 40-hour VM workshop	2
- Function Analysis System Technique (FAST) diagramming	2
- 2-day VM workshop	8
- Others	11
Q8. The ability of VM in achieving VFM without compromising quality	
- Strongly Agree	51%
- Agree	39%
- Neutral	5%
- Disagree	5%
- Strongly Disagree	0%
Q9. How can VFM be achieved? (Opened question)	
- Life Cycle Costing (LCC)	14
- Value analysis, with well planned (Good design and construction method)	9
- Justify the reason for that project	3
- Provide necessary functions	6
- Educating project team	1
- Involve all stakeholders in decision making process	1
- Measure for value (weighted option evaluation score that considers qualitative factors)	2
- Improve in time and people	1
- Meet customer's requirements	2
- Eliminating unnecessary costs	3
- Materials selection	4
- Safety	1
Q10. Does further Improvement exist for VM?	
- Yes	94%
- No	6%

Table 2: Summary of the Survey Results

The analysis of the survey indicated that more than three quarter of the respondents are familiar and have good understanding on the VM principles. The survey also shows that 60% of the respondents have experienced more than 15 times in the evaluation of building designs. Conceptual design stage ranks the top of the list where most VM studies

were carried out, followed by the detailed design stage. It is interesting to see that achieving VFM and the requests from the project sponsors or clients are the main reasons that initiated the adoption of VM studies in an organisation. However, common barriers encountered during the application of VM studies included 'the attitude of the designers' and 'too late in the detailed design stage'. According to the responses, the unwillingness of the designer to change his/ her design as to undertake additional works often results in the failure of cost savings. On the other hand, the results reinforced the literature findings that when the study was carried out too late in the design process, the redesign costs would be greater than the savings.

Whilst the practice of VM workshop would improve the VFM for the clients by eliminating unnecessary costs, many do fear that this might compromise the quality of works. That is one of the reasons why the designers are reluctant to change their designs. Some designers have the passion to push the limits by producing a unique design that adds values towards their goodwill but this is not common. Therefore it is always recommended that VM should be carried in the early design stage where the potential to change is the highest. From the findings, majority of the projects have achieved the cost savings from 5% to 10% by the implementation of VM workshop. The use of 2-day VM workshop is still common in the industry. However, it seems that the formal 40-hour workshop has declined and moved on to other format for similar purpose. Instead of a formal VM workshop, there are occasions that VM forms part of the agenda in a formal partnering workshop. In answering the research question, majority of the respondents (90%) agreed that VM can achieve VFM without compromising the quality of the project works. The Life-cycle costing technique is used to achieve the greatest VFM. Having said that, the respondents also suggested alternatives approaches of value analysis (in achieving VFM) by identifying the risks, barriers, construction methodology and well designed plan.

Interviews

The study of VM is wide in range and borderless. However the success in implementation of VM is arguable and its benefits and barriers never fail to generate a great deal of discussion or debate. In order to obtain an in-depth understanding of this research issue, structured interviews were carried out targeting the construction professionals in Adelaide. The interview questions were designed to obtain their personal opinions. Table 3 shows the profile of interviewees:

Interviewees	Sector	Position held	Role and responsibility
A	Private	Project Manager	✓ Provide series of services such as cost management, project management risk management, tax depreciation, LCC and etc.
B	Public	Civil Engineer	✓ Being an engineer, he is interested in research on VM approach and presented numbers of paper in conferences.
C	Private	Project Manager	✓ Experienced in delivering several VM workshops in middle-east countries.

Table 3: Profile of Interviewees

Table 4 below provided a summary of three interviews indicating the answers for various questions. Generally, interviewees had highlighted the practice of VM is a great solving tool in the construction industry and there is no reason to deny VM practice as a worthwhile exercise. VM is essential in identifying the objectives and requirements of clients, the potential deficiencies to the design and in the selection of materials that are durable and requiring less or easier maintenance. However, for some VM items, achieving cost savings might be minimal and time spent may not warrant a successful outcome. But it is important to try to identify the 'big ticket' items and the involvement of end users, particularly the facility management team who plays an important contribution towards the operation of the whole project works.

The common critique on the VM practices is that quality and cost may have compromised in some part of the works. Quality of works may not achieve the maximum functionality; this may be caused by over design in structure or inefficient in design. During the interviews, the key performance indicators (KPI) used to assess the effectiveness of VM practices have been identified as follows:

1. Achieving functionality and operational effectiveness
2. Minimising capital cost and recurrent expenditure, and
3. Satisfying stakeholders' objectives

Capacity of improvement is always present in any management tools. Suggestions by interviewees included:

1. Educating the professionals about the need for VM;
2. Integrating risk management into VM;
3. Variation to the traditional VM workshop.

Question	Interviewee A	Interviewee B	Interviewee C
Q1 (a). Familiarity of VM	- Very familiar	- Very familiar	- Very Familiar
Q1 (b). Project Involved	- Hotel & Resort; - Aged Care; - Residential; - Civil Engineer; - Commercial; and - Government & Local Government.	- Civil Engineer; and - Government/ Local Government.	- Residential; - Commercial; and - Government/ Local Government.
Q2. Effectiveness of VM	- Improve value for money; - Time improvement; - Cost saving; and - Provide a clear picture of project objectives.	- Improve value for money; - Time improvement; - Cost saving; and - Provide a clear picture of project objectives.	- Improve value for money; - Time improvement; - Cost saving; and - Provide a clear picture of project objectives.
Q3. How to achieve VFM?	- Efficiency in design; - Identify the objectives of the clients; - Operational effectiveness & functional effective; and - Identify deficiency in the planning process.	- Efficiency in design; - Identify the objectives of the clients; and - Operational effectiveness & functional effective.	- Analyse each possible alternative; - Identify the objectives of the clients; - Operational effectiveness & functional effective; and - Identify deficiency in the planning process.
Q4. The Key Performance Indicators (KPI) used to assess the effectiveness of VM practice.	- Achieving the functionality, operational effectiveness; - Minimising capital cost and recurrent expenditure; and - Stakeholders' objectives.	- Achieving the functionality, operational effectiveness; - Minimising capital cost and recurrent expenditure; and - Stakeholders' objectives.	- Achieving the functionality, operational effectiveness; - Minimising capital cost and recurrent expenditure; - Stakeholders' objectives; and - Project charter.
Q5 (a). Is VM a worthwhile exercise?	- Yes.	- Yes.	- Yes.
Q5 (b). Should the whole project team to be involved in VM?	- Yes.	- No.	- No.
Q6. How do unnecessary cost affects the quality of works?	- Unable to maximize the functionality of the building due to inefficient in design; and - Over design in structure.	- Heavy structure.	- Unable to maximize the functionality of the building due to inefficient in design.
Q7. Suggestion of further improvement for better outcomes.	- Educating/ Learning/ Communication the practice of VM to the industry; - Integrating risk management approach as an aid to VM; and - Variation to traditional method of VM workshop.	- Educating/ Learning/ Communication the practice of VM to the industry; and - Variation to traditional method of VM workshop.	- Educating/ Learning/ Communication the practice of VM to the industry; - Integrating risk management approach as an aid to VM; and - Variation to traditional method of VM workshop.
Q8. Is VM achieving VFM without quality compromising?	- Yes.	- Yes.	- Yes.

Table 4: Summary of Interviews

CONCLUSION

To achieve greatest VFM, VM study shall be taken at earlier stage of the project. By doing so, it is able to enhance the potential of cost savings to the highest level by identifying and eliminating unnecessary costs that are not beneficial towards the design. This also diminishes the possibility of functional and operational deficiencies of the construction project. Moreover, it has been identified that the whole of life cost (WLC) of the construction project is the main key of success in achieving VFM. A single VM workshop alone may not have the capacity to achieve its purpose. Team members shall analyse and indicate wisely if the clients have obtained the maximum benefits from the projects; in both acquisitions and provisions, within the resources available to it. Some elements may be subjective, difficult to measure, intangible and misunderstood. Judgement is therefore required when considering whether VFM has been achieved in satisfaction. VFM is not only measuring the initial costs of the projects, but also takes into account of the mix of quality, recurrent expenditure, use of resources, fitness for purpose, timeline, and convenience to judge whether they constitute good values.

Given the fact that the use of VM is not really popular in South Australia, there is obvious evidence that the concept and value of VM should be enhanced. Therefore based on the suggestions from the interviewees, the following three are recommended:

1. Integration of risk management and other management workshops to enhance the usefulness of VM.
2. Increase the awareness of construction clients of the benefits of VM which help in achieving best value by maximising the performance of works in value, quality, creativity and innovation.
3. Variation of the traditional method of VM workshop either as an agenda for planning or design consultant meetings or as an ordinary meetings for stakeholder discussion to catch up with the new methodologies of construction.

It is concluded that VM study is able to maximize the functional value of a building project; it should not be seen as a conflict-oriented design review, cost reduction or standardization exercises.

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