# An Integrated Value Management (IVM) for Construction Projects in Malaysia

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***Abstract* - Of late, the concept of Value Management (VM) is becoming vital in the implementation of construction projects. Value Management is a systematic and innovative methodology with multi-disciplinary approach targeted to achieve better value of construction products. However, VM is criticized for the fact that it focused solely on value for money, lack of creativity and fails to include the concept of risk management at the early project stage. Therefore, this paper intents to propose a new conceptual framework of Integrated Value Management (IVM) concept as an alternative to VM framework for construction projects in Malaysia. IVM is a combination of three (3) key components namely: Value Engineering (VE), Risk Management (RM) and Partnering to be incorporated in the development of construction projects. The study is purely based on literature review. It reviews the involvement of partnering in a project environment; value engineering approaches to ensure lowering cost while maintaining technical competence; and risk management for risk avoidance to project outcomes. Various models of VM are reviewed across the globe for the development of the framework. The development of an alternative Integrated Value Management framework throughout project phases is expected to give a more value added for both clients and project stakeholders.**

***Keywords -Integrated Value Management (IVM), Partnering, Risk Management (RM), Value Engineering (VE) and Value Management (VM)***

## I. INTRODUCTION

The importance of reducing costs, while at the same time, improving the value of construction products or services in the development of construction projects are increasingly recognised by many construction organisations. In fulfilling the client's perceived need, construction organisation is still facing confrontations in which, the demand of project outcomes are beyond client's expectations. In order to comprehend client's need in improving value for construction products, the concept of Value Management (VM) is inevitable in project implementation. VM is a systematic and innovative methodology with a multi-disciplinary approach targeted to achieve better value of construction products through decision making process [1]. This is in line with the views of Connaughton and Green [2] and Male et al. [3], indicating that VM is a method to help project client to achieve better project goals.

Nevertheless, since its introduction into construction projects, VM has faced several challenges that impede its effective application [4]. VM is associated with many misconceptions for the fact that many industry players confused VM with cost reduction exercises [5], consequently claimed that VM is focusing purely on value for money. To a certain extent, many researchers and practitioners regard VM as concentrating on the 'hard' technicalities such as cost reductions through life cycle costing, Function analysis System (FAST) diagrams and weight evaluation [6]. Thus, VM pays no attention to the functionality of the building. As a result, value engineering is chosen as an alternative approach to satisfy project clients to ensure project technical competence is achieved.

Since construction is an uncertain process, VM cannot guarantee a successful project outcome [2]. Construction projects are unique in nature and inevitably involve complicated and numerous risks [7]. Risk appears in specifying client's requirements that have been frequently overlooked in the VM literature. In fact, many clients may have difficulties in expressing their requirements precisely and do not know exactly what they really want. Construction projects involve different client's background therefore, there is an urge to integrate risk management concept to ensure the end product could satisfy both clients and project stakeholders.

In spite of value engineering and risk management concepts, partnering is also seen to be vital to be incorporated in the development of construction projects. Partnering could stimulate construction parties to cooperate in terms of providing financial aids, technology, skills, knowledge, resources, expertise to determine the efficiency and effectiveness of project outcomes [8].

Therefore, the integration of the three components namely: value engineering, risk management, and partnering in the development of construction projects is proposed as an alternative approach to Value Management. The study is purely based on literature review. The notion of an Integrated Value Management (IVM) approach is based on the premise that the three key components are inevitable in construction project development to enhance a successful project outcome that benefits to both clients and project stakeholders.

## II. THE BENEFITS.

The key components of IVM (value engineering, risk management, and partnering) are inevitable in the development of construction projects. For example, value engineering allow changes to be made during the design phase, hence it assists project client to obtain value for money. Value engineering is also beneficial to contractors because it offers the potential to earn higher profit margins while it enhances their reputation in the industry as low-cost providers of goods and services [9].

Meanwhile, risk management is important to both client and contractors. Construction industry has witnesses' significant changes particularly in procurement methods with clients allocating greater risks to contractors [10]. Unfortunately, many contractors do not have the experience and knowledge to manage the risk effectively. Therefore, by adopting risk management, risks are assessed by their potential effect on the development of the project. It would be an important tool for contractors to increase their awareness, identify global risk factors affecting cost performance, assess their impact and likelihood and take appropriate measures in order to reduce their impact on cost performance[10].

The concept of partnering in construction addressed true trust-based relationship [11]. Some projects faced challenges by adversarial relationships, conflict and distrust among stakeholders. In this regards, the use of partnering arrangement can create more cooperative and trusting relationship between clients and contractors. For example, in traditional contract the contractor has the exclusive right to carry out any additional work necessary due to design changes and contractual omissions on cost reimbursable term with the clients' consent [11].

## III. THE CONCEPT OF INTEGRATION.

The concept of integration, which derives from the Latin word "integrates", which means that various elements of the project are properly coordinated [13]. Austin et al. [14], Jaafari and Manivong [15] and Baiden et al. [16] define integration as the merging of different disciplines or organizations with different goals, needs and cultures into a cohesive and mutually supporting unit. Meanwhile, a study carried out by Baiden et al. [16] on team integration within construction projects, revealed that the integration approach and collaborative work practices could lead to project efficiency and enhanced successful project outcomes. Albeit the term integrated value management is not defined for the purpose of the study, based on the above definitions, IVM approach in construction best refers to bringing and joining together a number of distinct things into a specific project to move, operate and function as a harmonious and most favorable tactic with the ultimate aim to achieve a successful result.

Table 1.0 shows five types of integrated key disciplines models by various researchers. The first model was developed by Jergeas et al. [12]. The model of IVM consists of four components: strategic alliances/ partnering, value engineering, risk management and constructability. According to them, long term relationship with commitment from various experts in constructability, value engineering and risk management are able to respond to the client's demand and perceived needs as they committed during the early project phase.

Meanwhile, the second model of VM framework by Dumond [17] stresses on five components namely: training, information system, job design, interface relationship, and performance measurement system. It is through these disciplines that could help in strengthening project organization's culture and emphasis on continuous improvement [17]. He believes that, the model could provide capability, ever-improving value to client and overall project performance.

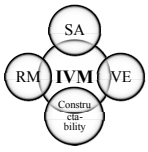
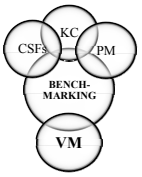
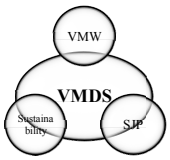
| Author | Jergeas et al. (1999) | Dumond (2000) | Fong et al. (2001) | Zainul-Abidin and Pasquire (2005) | Bowen et al. (2010) |
|---|---|---|---|---|---|
| Integrated Element | **Integrated Value Management**<br>• Strategic Alliances (SA) /Partnering<br>• Value Engineering (VE)<br>• Risk Management (RM)<br>• Constructability | **VM Framework**<br>• Training<br>• Information System (IS)<br>• Job Design (JD)<br>• Interface Relationship (IR)<br>• Performance Measurement System (PMS) | **VM Benchmarking Process**<br>• Value Management (VM)<br>• Benchmarking<br>• Key characteristics (KC)<br>• Critical Success Factors (CSFs)<br>• Performance Metric (PM) | **VM Delivering Sustainability**<br>• VM Workshop (VMW)<br>• Sustainability<br>• Structured Job Plan (SJP) | **VM Practice**<br>• Value Management (VM)<br>• Risk Management (RM)<br>• Total Quality Management (TQM) |
| Diagram |  |  |  |  |  |

Table 1: Key discipline model for Value Management Approach in Construction Industry

The third model of VM benchmarking process in construction is established by Fong et al. [1]. In this model, they focused on five components: value management, bench marking, key characteristics, critical success factors, and performance metrics. The idea came from Youssef and Zairi [18] who studied benchmarking TQM with emphasis on the generic of soft nature of TQM, which could be applied to various job setting. They claimed that their VM benchmarking process model could help project managers to improve project efficiency and effectiveness.

The fourth of VM delivering sustainability model is by Zainul-Abidin and Pasquire[19]. The model emphasises on three key components: VM workshop, sustainability and structured job plan which should be effectively managed in the construction project processes. The issues of sustainability is the focal point of the model as it concerns in protecting environmental quality, enhancing social prosperity and improving economic performance [20].

The fifth of VM practice model is by Bowen et al. [21] which integrate three key components i.e., value management, risk management in practice and total quality management (TQM). The characteristics of VM and its intrinsic link with risk management and TQM form a foundation that supports the potential for effective integration.

Given the above, these five concepts of VM show some similarities and differences between them. Combining the ideas of these researchers, the development of IVM framework in Malaysia of using three key components (value engineering, risk management and partnering) is a potential approach to serve project client, contractor and respective stakeholders.

## IV THE DEVELOPMENT OF POTENTIAL OF IVM FRAMEWORK IN MALAYSIA

Figure 1 presents vital ingredients for the development of IVM concept in construction adopts the views of the five respective models above developed by Jergeas et al. [12], Dumond[17], Fong et al. [1], Zainul-Abidin and Pasquire[19] and Bowen et al. [21]. Among others, the idea of Jergeas et al. [12] seems to be simple and could be adopted in the development of IVM across project phases. It is notable that value engineering, risk management and partnering are essential throughout project life-cycle. As design decisions are made, all risks are identified, potential cost savings are established and responsibility to manage the entire project is planned involving various parties as potential partners.

The first component is value engineering (VE), the process of relating the functions, quality and costs of the project to determine optimum solutions for the entire project [27]. More specifically, VE also act as a management technique for improving client value in projects, products, processes and systems[28]. It shows that VE is not only focusing on cost

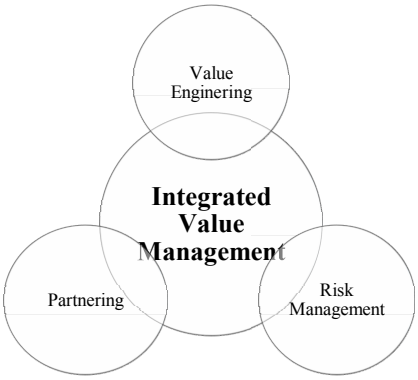



Figure 1: The Essential Ingredients of IVM

reduction itself but also seeking for high value and client's satisfaction of the whole project. Although VE has its origin in the manufacturing industry, its methodology has been well developed for use in the construction industry [27]. Organized engineering at the start of a project can significantly reduce project life-cycle costs. VE requires continuous communication between client and contractor throughout the duration of the project. It is crucial to determine client's needs, preferences and requirements as well as identify the best option available.

Meanwhile, risk management (RM) is a fundamental to accomplish business objectives, acting as a guide to maximize positive results of project outcomes[25]. The direct impact of effective risk management could enable all parties to the contract to understand and manage the key issues of the project with possible measures to be adequately undertaken [7]. However, lack of risk management processes could increase uncertainty to project outcome; suffer financial loss, liabilities that may have been overlooked, and ineffective decision making [26].

The concepts of partnering in construction projects create a win-win situation environment where trust and teamwork prevent disputes, promote a cooperative bond to everyone's benefit and facilitate the completion of project successfully. Partnering aims at stimulating construction parties to cooperate, initiating constructive discussions, formulating the most appropriate goals and objectives, and determining efficient and effective tools and techniques for the construction projects[ 22], [23], [24]. Hence, the intrinsic capabilities and positive relationship among value engineering, risk management and partnering heighten IVM position as an effective means for the improvement of project performance leading to effective outcomes, in particular to Malaysian construction industry.

## V PROPOSED A CONCEPTUAL FRAMEWORK

Figure 2 proposes a conceptual framework of an integrated value management (IVM) across project phases based on the information gathered.

Fundamentally, the propose framework starts with *strategy formulation phase*, followed by project briefing, design, procurement, construction and finally project handover. The integrated disciplines; value engineering (VE), risk management (RM) and partnering are expected to be incorporated at all project phases. Along of these phases, the critical success factors (CSFs) are identified to enable project to be completed successfully on time, within allocated budget, good quality, functionality, optimal risk sharing and to client satisfaction [29]. This framework has outlined the possible path for bringing the alternative integrated concept to the attention of the clients and other VM practitioners.

The strategy formulation phase generally concerned with identifying the broad scope and purpose of the project and its important parameters [28]. Kelly et al. [28] reckon that *briefing phase* describes clearly and objectively the mission of the project and its strategic fit with the corporate aim of the client organisation. Thus, the contribution of IVM is to identify role and purpose of the project and helps project clients expressing clearly their strategic needs to obtain high quality of outcomes to which they aspire.

The *design phase* is emphasises on the development of ideas from multi-disciplinary group of people, selected for their competence, expertise and responsibility in various aspects of the project working together to produce the best possible proposals for the project [30]. At this stage, IVM is used to assist project team to solve design problems and ovoid over design that might cause unnecessary cost [3].

The procurement phase, however involves the bidding process in which contractual proposals are prepared and detailed project delivery method is planned and executed [28]. There has been a considerable experimentation with the choice of procurement used, with the objective of making the design and construction process more interactive. Hence, the IVM concept enables consistent creation of value for project by focusing on cost and quality towards a successful end product.

The *construction phase* involves a construction execution in which jobsite monitoring and controlling are conducted. In this phase the concept of buildability is assimilated by specialist contractors. The essence of IVM is to ensure that information flows does not interrupt the construction process. With good experience and knowledge owned by each of the person involves, in particular project contractor, it would be beneficial to guarantee the construction process runs smoothly and efficiently. In this context, the skills of the value manager is required with the ability to understand value for money, structure a process, bringing the representatives from competing value system together and introduce improvements to encourage the team to work in unity and achieve what has been targeted [3].

## VI. CONCLUSION

At present, managing large and multi-tasking projects is a complex phenomenon which constitutes a major challenge to the entire network [21]. This paper has presented a new paradigm shift from a value management (VM) concept to integrated value management (IVM) in the development of construction project across project phases. The idea of IVM is to integrate three major components (i.e., value engineering, risk management and partnering) in the development of

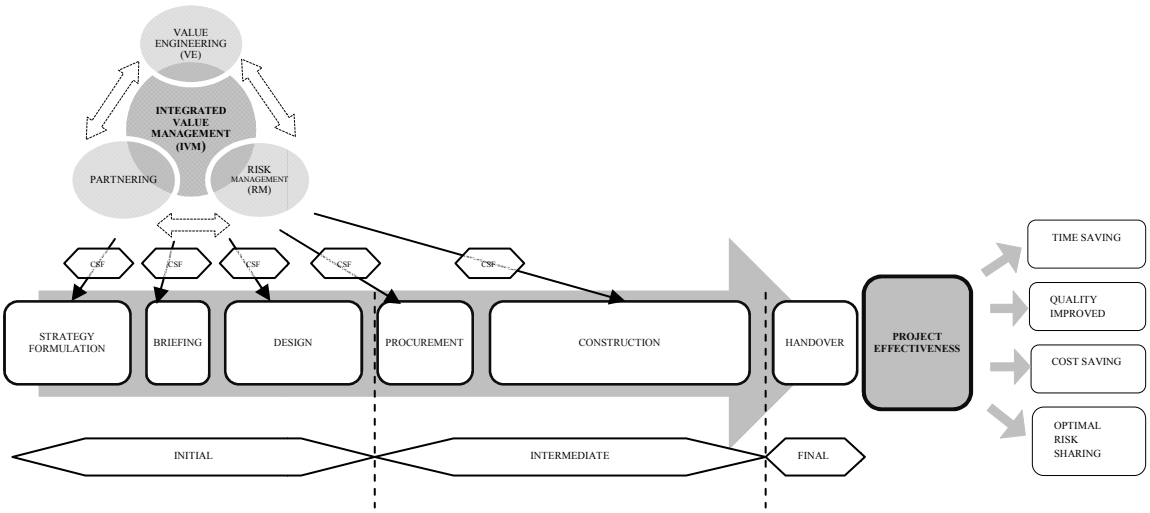



Figure 2: Proposed a conceptual framework of an Integrated Value Management (IVM) in construction projects

construction projects. Since the ability to add value in construction project is being curtailed by poor performance within construction, project management has to consider the integrated concept in several contexts as a mean for a successful project delivery.

The next stage of the research is to conduct a primary data in integrating the concept of IVM across project phases in order to obtain the real views from project team and its implication as opposed to value management (VM).

The research presented in this paper is part of an ongoing M.Sc research at Faculty of Architecture, Planning and Surveying, UiTM to develop a framework of integrated value management (IVM) assessment for construction projects. This is the initial stage of the study, thus no data or actual result presented. The results of the study could provide an insight into the Malaysian construction project development and could provide valuable guideline, especially to public and private sectors in Malaysia.

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