

Improving The Organizational Culture of Key Stakeholders Involved in Value Management Process to Achieve Optimum Value in Malaysian Construction

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Abstract: *Value Management (VM) is necessary for all construction projects to achieve value for money. There is a need to improve the organizational culture of key stakeholders involved in VM process to achieve optimum value in Malaysian construction projects. This paper is part of a larger study aiming to develop a culture-based organizational model for key stakeholders involved in VM process for achieving optimum value in Malaysian construction projects. This study utilizes a systematic literature review synthesis method to evaluate the trend, identify the gaps and recommend future approach in order to improve the organizational culture of key stakeholders involved in VM process that focuses on achieving optimum value in VM. The results include analyzing current VM status quo in Malaysian construction industry, determining the challenges faced in the VM process of generating innovative ideas, and exploring the project value creation to achieve optimum value. Upon introducing the background problem, the paper deliberates the synthesized literature reviews on VM, key stakeholders, VM process and project performance with VM. A cross-analyses discussion contributes towards formulating the culture-based organizational model for VM practice in Malaysia. The results are expected to improve the integrated project delivery performance of Malaysian construction industry stakeholders by understanding critical VM success factors and weaknesses of VM key stakeholders' team in generating innovation ideas for optimum project delivery value.*

Keywords: value management, project value optimization, organizational culture, integrated project delivery, built environment informatics

1. Introduction

Value Management (VM) is relatively new in Malaysia context but Economic Planning Unit (EPU) via VM Circular 3/2009 in December 2009, has enacted the requirement for VM studies to be implemented for all public projects exceeding RM50 million in cost (Jaapar, Maznan & Zawawi, 2012a). Maznan, Jaapar, Bari and Zawawi (2012) stated that subsequent to the enactment, VM studies have been widely adopted within a period of 1 month, in more than 50 public projects costing over RM50 million. Abd-Karim, Wah, Jaapar, Suhaimi and Berawi (2017) underlined that projects of such massive scale represents a small portion in the industry and are usually carried out by top-tier contractors and further inferred that most Malaysia construction projects have low exposure to VM.

Maznan et al., (2012), underscored that practitioners from private sectors is less receptive of VM in comparison to public sector due to misconceptions and relatively lacking in exposure and knowledge on VM.

Jaapar et al. (2012b) and Mahmoud et al. (2019) in analyzing VM stakeholders' responsiveness and challenges encountered during VM workshop, highlighted lack of studies on importance and implication of participants' behavior throughout VM process. Mahmoud, Ahmad and Idrus (2019) endorsed the use of interest-based ranking during VM workshops but may renders discordancy among stakeholders. As an alternative, the teams suggested weight-based ranking with lesser conflict, but is heavily influenced by authority that will affects reliability in decision making. Lin, Mazlan, Ismail, Hu, Kasiman and Yahya (2022) who reviewed 104 numbers of publications from year 2001 to 2021, postulated that researchers are more keen on investigating strategy, outcome, and achievements of VM in various construction projects. Trending studies in VM are focusing more on implementation (Hwang, Zhao & Ong, 2015; Latif, Usman & Pirot, 2020; Othman, Kineber, Oke, Zayed, & Buniya, 2021) acceptance (Abd-Karim et al., 2017; Perera, Hayles, & Kerlin, 2011; Kineber, Othman, Oke, Chileshe, & Alsolami, 2020), performance (Oppong, Chan, & Dansoh, 2017; Chen, Chang, & Huang, 2010; Lee, Lim, & Hunter, 2010; Chen, & Liao, 2010) impacts (Mok, Shen, & Yang, 2015; Alan Short, Barrett, Dye, & Sutrisna, 2007; Kineber, Othman, Oke, Chileshe, & Buniya, 2021; Yu, Robati, Oldfield, Wiedmann, Crawford, Nezhad, & Carmichael, 2020) and strategy (Nawi, Jalaluddin, Zulhumadi, Ibrahim, & Baharum, 2014; Mohamad Ramly, Shen, & Yu, 2015; Robati, Oldfield, Nezhad, Carmichael, & Kuru, 2021) with behavioural elements of VM thus making their studies more holistic. This study proposes to extend the behavioral effects of the VM participants towards optimizing VM performances for better integrated project delivery process in the Malaysian context.

2. Research Methodology

This study selected related articles under organizational culture, VM process and achieving optimum value for reporting. Using search engines, such as Google Scholar, SCOPUS, etc., these articles were identified with keywords related to the selected major themes such as VM key stakeholders, organizational culture theory, areas of VM process, optimum value in VM and project performance with VM. Upon filtering out full research papers and title search spanning from year 2007-2022, a total of 60 of journal articles were identified. The abstracts were further reviewed in term of benefits to future studies, major discoveries by previous academicians, and areas of prospective enhancement. The abstracts were subsequently categorized according to relevant sub-themes based on empirical importance rather than having equal distribution throughout the sub-themes. The main 60 reviews with high prospects in addressing the main study's problem were shortlisted for the subsequent literature synthesis review process. The study notes that a new, but critical, emerging theme may have lesser literature articles as references.

The outcomes of this exercise produce a synthesized summary for each main theme to generate further cross-analysis, integration of possibilities, and prioritization of the synthesized summaries towards high probable solutions for improving the organizational culture of key stakeholders participating in VM procedures. The resulting key synthesized summaries are presented in the "Point of Departure (POD) Tree Diagram" adapted from Ibrahim and Mustafa Kamal (2018). This study used the EAGLE Navigator online system to document the literature review synthesis process and adapted the results for reporting in this paper.

3. Research Background

3.1 Value management in construction industry

This section covers VM key stakeholders and VM's critical success factors (CSFs). The aim is to identify key stakeholders who are involved in the VM process in Malaysian construction projects and the CSFs.

3.1.1 Value management key stakeholders in construction industry

The key VM stakeholders in the construction sector comprised of multi-disciplinary VM team leader, architects, cost engineers, and other disciplines (Ghareeb & Sameh, 2022). Fong and Shen (2000), who studied the future outlooks and barriers hindering the implementation of VM among stakeholders in Hong Kong construction sector, highlighted the misconception of VM that affect the clients and industry professionals. Majority of the key stakeholders are oblivious and only a handful have experience in VM study. Thiry (2000) underscored that VM process will benefit from sensemaking and its influence on participants' readiness to accept or decline a change process. The researcher highlighted that this transition is imperative for VM implementation and the intent of VM workshops and affiliated research necessitate re-evaluation when incorporating sensemaking. Besides, culture has significant influence over inter-collaboration of the involved organizations. Organizational characteristics can be categorized into policies and statutes, management's direction, organizational structure, and culture will impact on the efficiency of the inter-organizational partnership (Kožuch & Sienkiewicz-Małyjurek, 2016), notably in a VM team comprised of various disciplines and organizations.

Othman et al., (2021) raised the concerns of insufficient training and experience that is further complicated by challenging engagements of key decision-makers and other stakeholders in the VM process. Invernizzi, Locatelli, Grönqvist and Brookes (2019) highlighted that lengthy and complex nature of infrastructure decommissioning projects necessitate the involvement of extensive network of stakeholders. They underlined that experienced decommissioning practitioners concluded that VM implementation improves knowledge and efficacy of decommissioning projects.

In the 2000s, Fong and Shen (2000) and Thiry (2000) were struggling in raising awareness of VM among VM stakeholders and also integrating sensemaking in the VM process. Two decades later in the 2020s, Othman et al. (2021) discovered it is still a prevailing hurdle to enlist key stakeholders' involvement in the VM workshop. Invernizzi et al. (2019) also emphasized on the need to implement VM in complex projects involving a wide array of stakeholders.

Therefore, the CSFs of VM necessitate the involvement of an extensive network of stakeholders who are open to change of perceptions, increased participation, improvement of knowledge and facilitation skills and training, culture, environment, workshop dynamics and adopt standardization.

3.1.2 Critical success factors of value management

Kineber et al., (2021) have categorized culture and environment, stakeholders and knowledge, workshop dynamics, and standardization as the CSFs affecting VM implementation for residential building projects. Through studies in value engineering workshop (VEW) performance, Chen et al., (2010) discovered that performance of VEW will be enhanced when utilizing the proposal in process enhancement, self-diagnosis and group motivation. The

researchers found that VEW's success is dependent on VEW team's autonomy in rendering unbiased advice, perspective, and judgment as it is critically depended on personality of the principal and members.

Alsolami (2022) highlighted 25 CSFs that affect VM adaption by key consultants and contractors in Saudi Arabia construction sectors. The researcher suggested the main factors were the company's aptness in facilitating a VM workshop through effective interaction between VM stakeholders, as well as competency and experience of workshop facilitator. Strategic partnership through workshop, value-centric procurement and early participation are essential to success of the project (Wøien, Hosseini, Klakegg, Lædre, & Lohne, 2016). The research team further emphasized on the importance of soft factors such as commitment, competency and confidence.

Based on the above literature review, this study deduced that a VM team must be multidisciplinary and their performance can be enhanced by incorporating the CSFs consisting of VM stakeholders and knowledge, culture and environment, workshop dynamics, standardization, team personality, team independence, commitment, trust, and competence among VM team.

3.1.3 Synthesis of Theoretical Summaries

This section cross-analyses, integrates possibilities, and prioritizes the synthesized literature review summaries under the thematic theme organizational culture towards high probable solutions towards improving the organizational culture of key stakeholders during the VM process. The CSFs of VM require the involvement of an extensive network of stakeholders and it is critical on their willingness to change their perceptions; increase their participatory contributions, improve their knowledge on facilitation skills and training; and embrace the culture and environment of VM workshop dynamics with certain standardization. Hence, this study posits that VM practice in Malaysia would require the involvement of stakeholders with appropriate knowledge, culture and environment to create VM workshop dynamics. In achieving the VM workshop dynamics with certain standardization, such VM workshop would help the stakeholders to achieve the optimum value for their respective projects. Figure 1 shows how the literature review synthesis develops the proposed theory regarding improving the organizational culture of key stakeholders involved in VM process. In summary, apart from recognizing the need of the involvement of stakeholders to achieve optimum value for projects, this study proposes to researchers to study how their participation in current VM process would actually affect the value outcomes as illustrated in the proposed conceptual framework in Figure 2.

3.2 Value management process

This section covers areas of VM process. The objective is to determine the areas in VM process affected by organizational culture of key stakeholders in Malaysian construction projects.

3.2.1 Areas of value management process

The study of value is categorized into three critical stages: 1) the orientation and diagnostic stage, 2) the workshop stage, and 3) the implementation stage. The benchmarked VM process comprised of seven steps, namely the pre-study information, the VM workshop (steps consisted of information, creativity/innovation, evaluation, and option/idea development), the workshop report and the implementation step (Kelly, Male & Graham, 2014).

A study by Bowen, Edwards, Cattell and Jay (2010) underscored that the VM awareness among South African engineers is prevalent but the actual application in the industry is relatively limited. Bowen et al., (2010) also highlighted that VM activities have yet to be benchmarked against international standards - and existing standard methodology.

Liu and Leung (2002), through the development of soft VM model, underlined that project objectives can only be achieved through effective communication between the client and the project team members. The researchers also highlighted that project goal specificity at the inception of the project enhances participants' dedication and promotes clarity in decision making throughout the project realization stage.

Lee, Hyun & Hong (2009) highlighted that the Value Engineering (VE) exercises been implemented for half a century since its initial introduction to the construction industry. The team underlined that considerable amount of VE proposals (VEPs) are implemented through the synergy of innovative ideas generated by industry specialists of diversified expertise, backgrounds, exposures and knowledge, Nevertheless, the team raised concern on the sluggish effort from construction sector to systematically archive and adopt the cumulative knowledge. These studies suggest that VM process can be enhanced when it is benchmarked against international standards and effective communication between the client and the project team members outline goal specificity during project commencement. Documenting and learning from the output of VM/VE (i.e. VEPs) are also part of VM process improvement that can be investigated.

3.2.2 Synthesis of Theoretical Summaries

This section cross-analyses, integrates possibilities, and prioritizes the synthesized literature review summaries under the thematic theme of VM process towards high probable solutions for the incorporation of VM international standards with project direction at the initial stage to enhance the organizational culture of key stakeholders involved in VM process.

Therefore, the VM process will be improved when it is benchmarked against international standards with a project direction derived at the early stage through effective communication between the project owners and inter-disciplinary consultants. Figure 1 shows how the literature review synthesis develops the proposed theory regarding the VM process to improve the organizational culture of key stakeholders involved in VM process and the subsequent proposed conceptual framework in Figure 2. In summary, Stakeholders' involvement in VM process will determine the success of the VM outcomes. In order to understand the success of VM process or to determine whether the optimum values have been achieved through the VM process, the section follows will review the definition of optimum value or VM success.

3.3 Achieve Optimum Value

This section covers optimum value in VM and project performance with VM. The objective is to develop an organizational culture model for key stakeholders involved in VM process to achieve optimum value in Malaysian construction projects.

3.3.1 Optimum value in value management

VM underscores various and even contradicting priorities to facilitate stakeholders to collectively achieve optimum value (The Institute of Value Management, n.d.). Green (2002) underscored VM's objective is to facilitate project stakeholders in developing a collective apprehension of the design challenges and objectives. The researcher highlighted on increased probability in collective decision-making when various groups with conflicting interests are

involved during the design stage. Male, Kelly, Gronqvist and Graham (2006) stated that VM functions as a management-centric methodology to improve values in projects and linking conceptual thinking of VM and VE precedents. The team also suggested optimum values can be achieved by improving the value thinking among the VM participants. Noting that many management and design methodologies for projects had limited costs and resources, Lalevée, Troussier, Blanco and Berlioz (2020) further proposed VM as a sustainable methodology to address ever-changing environment, social, technical contexts and complexity involving stakeholders of different expertise.

Berawi et al., (2014) identified innovative solutions for mega infrastructure projects by merging quantitative and qualitative methods in the distribution of questionnaire survey templates to focus group discussion (FGD) and project stakeholders. The team also deduced the value generation process can be achieved through the participation of the key stakeholders and life cycle cost analysis further substantiated cost increments resulted by additional functions for the projects. Most VM studies focused on value achieved in the area of cost reduction and saving. For instance, Khodeir and El Ghandour (2019) observed that VM can reduce 15% - 40% in total project cost and prevent cost overrun for an Egypt residential project. Kineber et al. (2022) postulated the major challenge in the maintenance and function-enhancement of major sewer projects within affordable cost can be addressed by adopting VE concept during project assessment stage. Hill and Zeller (2008) proposed few imperative but underutilized strategies focusing on transactions cost and strategic cost management theories that further underscored VM benefits for both public and private projects.

VM does not only focused on cost savings but contribute to value creations from VM methodologies. Green and Sergeeva (2019) stated two VM approaches: The first approach is based on the traditional narrative of VE (aka Hard VM) that focused primarily on cost reduction whilst the second approach is known as 'soft' VM (Soft VM) which emphasizes on achieving shared understanding of the value criteria of individual project. Heralova (2016) highlighted that timely adoption of VE methodology can significantly reduce costs and improve performance of project performance by synergizing budget, scope of works, and schedule through generation of innovative ideas.

Achieving a balance of values for a project with different complexities and involvement of various stakeholders can be disconcerting. Corsaro (2018) asseverated that the interactional, interdependent, and dynamic nature of value co-creation has rendered complication in VM implementation due to the interdependence with various value process. Tohidi (2011) underlined the innovative management and VE application within the organized framework promotes increased performance and saving in cost throughout the project life cycle. Gillier, Hooge and Piat (2015) highlighted the need to transcend beyond familiar practice and encourage embracing of innovative studies and long-term vision.

Owing to the complexities involved in VM, many studies discussed the issues associated to the process of achieving optimum values via VM process. Shen, Chung, Li and Shen (2003) introduced the application of Group Support System (GSS), that employs software and technology driven techniques, that promotes communication, deliberations and decision-making to address existing problems in VM studies. Haddadi, Temeljotov-Salaj, Foss and Klakegg (2016) postulated that the concept of value is backed by decade-old studies derived from diverse industries such construction, real estate, and facility management industry. Haddadi et al., (2016) highlighted due to the long running nature of building life cycle and

evolving user's requirements, VM approach shall be both user-centric and owner-centric to improve value creation.

Luo, Shen, Fan and Xue (2010) introduced a group decision support system (GDSS) to provide a computer-aided collaborative work environment to enhance VM methodology in construction briefing by promoting participation and interaction, the reduced timeline, and the improved satisfaction of stakeholders in the VM workshops. Shen and Chung (2001) highlighted that GDSS' success in promoting active participation and interactions, as well as decision making among stakeholders. Fan and Shen (2010) further investigated the benefits of employing interactive value management system (IVMS), a web based GDSS, during VM workshops through the usage of competing value approach and deduced IVMS promotes ideas generation among stakeholders through enhancement of the efficiency, information reliability and supportability of decision and participation process.

Numerous studies were focused on cost saving as optimum value of VM, while others were using VM to achieve a balance of cost, schedule, and scope. To implement VM in projects that are complex and involve various stakeholders, several studies have recognized the need to aid and facilitate VM in the people aspects when VM stakeholders participate and interact to co-create value via VM. It can be concluded that optimum value can be achieved through VM where innovative ideas are generated via stakeholders' participation and interaction.

3.3.2 Project performance with value management

Heralova (2016) studied the VE implementation in highway construction project and deduced VE generate innovative solutions through synergizing cost, values and project schedule. The team postulated that a project benefits from costs saving and improved performance through timely application of VE process.

The improvement of project performance with VM is evident in numerous studies, however, Thiry (2001) highlighted greater synergy can be achieved when VM is concurrently implemented with project management to achieve an integrated learning-performance program management model. The suggestion by Thiry (2001) concurred with Lee et al. (2009) who found that many VE proposals benefitted by individual projects were not systematically compiled for a holistic assimilation by the construction industry.

Findings from Laursen and Svejvig (2015) on 111 literatures using both inductive and deductive approaches spanning from 1980s to current days are still based on value-centric view. The team suggested to research on project value creation through four directions for future research: rejuvenating VM through combining value, benefits, and costs; supplementing value creation with value capture; applying a holistic approach to project, portfolio, and strategic management; and theorizing by applying independent models and frameworks. Recently, Lin et al. (2022) suggested that not much studies have been carried out to improve VM implementation. Based on Laursen and Svejvig (2015), a study based on strategic management that stems from VM key stakeholders could be a way forward. Project value creation can be achieved by key stakeholders when cost, schedule and scope are balanced.

3.3.3 Synthesis of Theoretical Summaries

This section cross-analyses, integrates possibilities, and prioritizes the synthesized literature review summaries under the thematic theme to achieve optimum value towards high probable solutions.

Optimum value can be achieved when cost, schedule and scope are balanced through VM workshop where innovative ideas are generated via stakeholders' participation and interaction. Figure 1 shows how the literature review synthesis develops the proposed theory regarding the achieve optimum value and project performance to improve the organizational culture of key stakeholders involved in VM process and the subsequent proposed conceptual framework in Figure 2.

The summarized theories from the above will generate a theoretical proposition useful the main study of this research to understand the phenomenon and provide improvement to the current VM practice in the construction industry.

3.4 Developing theoretical proposition

This section further cross-analyses the resulting proposed theoretical propositions from each RQ Constructs—organizational culture, VM process and achieve optimum value—to develop this study's theoretical proposition.

Summary of Section 3.1 concluded the point of view (POD) 1, where VM requires the involvement of stakeholders and knowledge, culture and environment, workshop dynamics, and standardization in order to achieve optimum value for projects [POD1]. Section 3.2 concluded that the VM process will be improved when it is benchmarked against international standards with a project goal specificity at the commencement of the project which are obtained through the interaction between the client and the project team members [POD2]. Lastly, section 3.3 concluded that optimum value can be achieved when cost, schedule and scope are balanced through VM workshop where innovative ideas are generated via stakeholders' participation and interaction [POD3].

With the synthesis of the POD1 and POD2, it was deduced that VM process will be improved when it is benchmarked against international standards with a project goal specificity at the commencement of the project which are obtained through the interaction between the client and the project team members [POD4]. While the synthesis of POD2 and POD3 resulted in POD5, which stated that the VM process will be improved and optimum value can be achieved when cost, schedule and scope are balanced through VM workshop where innovative ideas are generated via stakeholders' participation and interaction [POD5]. POD 6, which was derived from the synthesis of POD3 and POD1, mentioned that VM requires the involvement of stakeholders and knowledge, culture and environment, workshop dynamics, and standardization in order to achieve optimum value via stakeholders' participation and interaction [POD6].

Moving to the next level of synthesis, the synthesis between POD 4 and POD5 resulted in POD7 which proposed that the VM process will be improved and optimum value can be achieved when cost, schedule and scope are balanced through VM workshop where innovative ideas are generated via stakeholders' participation and interaction [POD7]. By synthesizing POD5 and POD6, this study proposed that VM requires the involvement of stakeholders and knowledge, culture and environment, workshop dynamics, and standardization in order to achieve optimum value when cost, schedule and scope are balanced through VM workshop where innovative ideas are generated via stakeholders' participation and interaction [POD8].

Finally, POD9 is obtained by synthesizing POD7 and POD8 that concluded that the involvement of stakeholders and knowledge, culture and environment, workshop dynamics, and standardization will contribute to achieve optimum value through VM workshop where

innovative ideas are generated via stakeholders' participation and interaction. Figure 1 shows the synthesized of the literature review point of departures to propose potential theories for solving the study's problem. Figure 2 is the proposed theoretical framework to be studied in the subsequent work of this study.

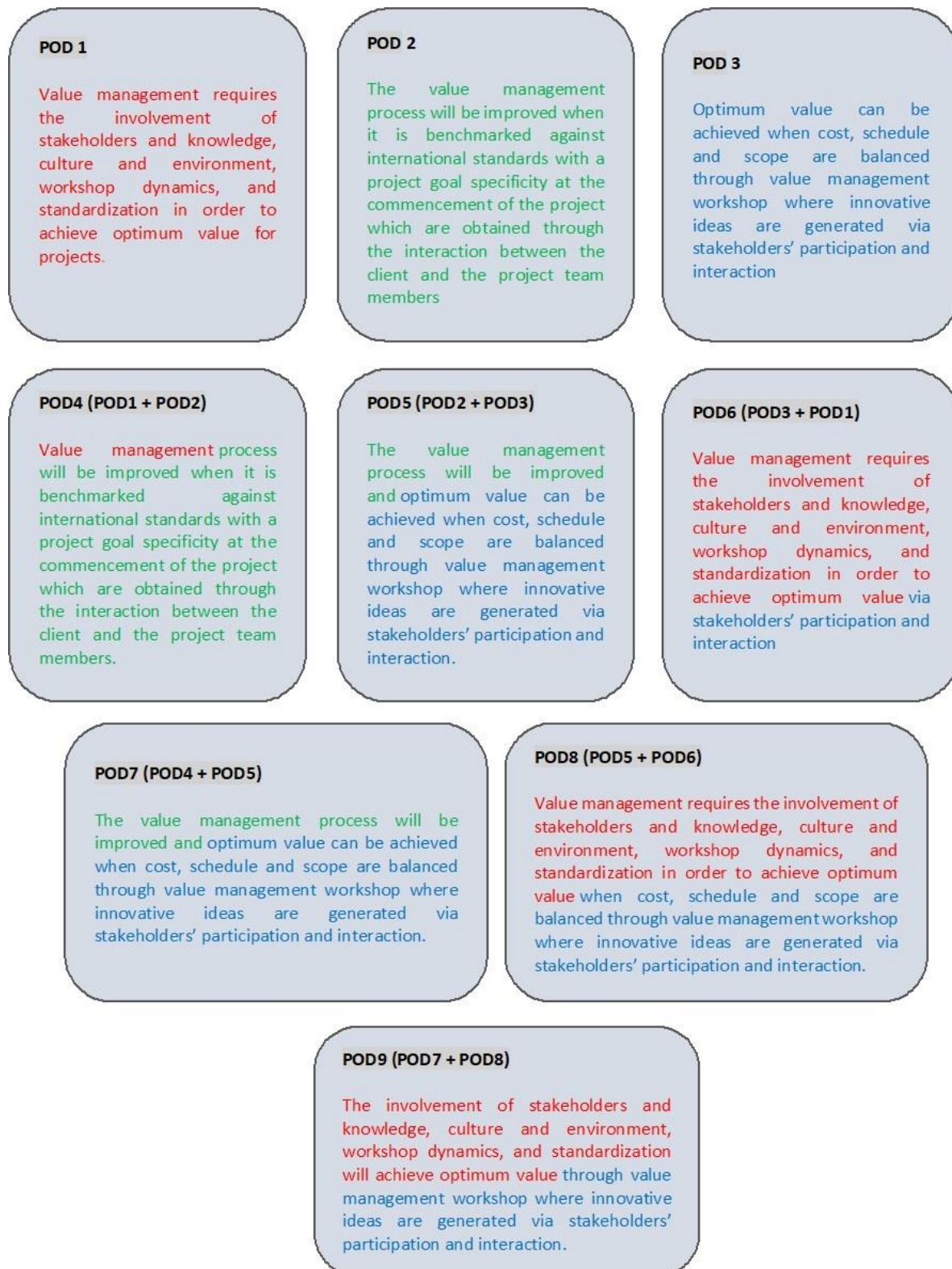


Figure 1: Point of Departure (POD) Tree Diagram (Adapted from Ibrahim & Mustafa Kamal, 2018)

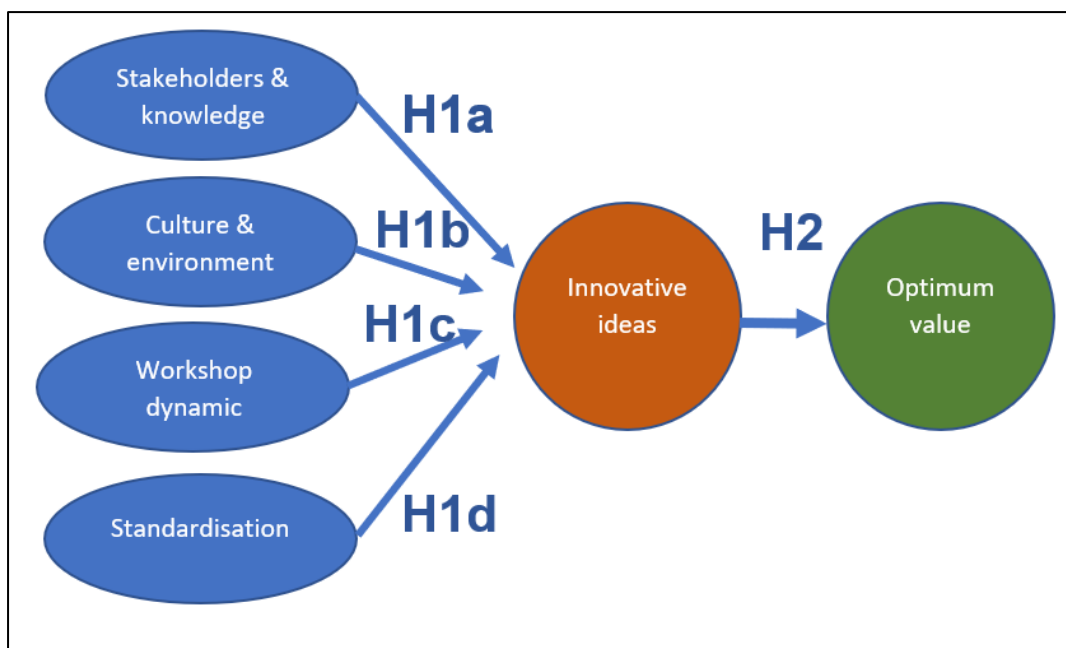


Figure 2: Proposed Conceptual Framework based on Theoretical Proposition for the Thesis (Adapted from Ibrahim & Mustafa Kamal, 2018)

4. Conclusion

This paper documented the systematic literature review synthesis process for this study that includes topics such as organizational culture, VM process and achieve optimum value. For organizational culture, the study found that VM requires the involvement of stakeholders and knowledge, culture and environment, workshop dynamics, and standardization in order to achieve optimum value for projects. For VM process, the study indicates VM process will be improved when it is benchmarked against international standards with a project goal specificity at the commencement of the project which are obtained through the interaction between the client and the project team members. To achieve optimum value, the study suggests achieving a balance of cost, schedule, and scope through VM workshop where innovative ideas are generated via stakeholders' participation and interaction. Further synthesis of the above results concludes that the involvement of stakeholders and knowledge, culture and environment, workshop dynamics, and standardization will contribute to achieve optimum value through VM workshop where innovative ideas are generated via stakeholders' participation and interaction.

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