Developing the Value Management Maturity Model (VM3©)

Saipol Bari Abd Karim[1], Rabi'atul 'Adawiyah A. Rahmin [2], Mohd Suhaimi Mohd Danuri[3] and Othman Mohamed[4]
Department of Quantity Surveying, Faculty of Built Environment,
University of Malaya, 50603 Kuala Lumpur, Malaysia.

[1]saipolbari@um.edu.my, [2]raby.rahmin@yahoo.com, [3]msuhaimi@um.edu.my, [4]othmanmohamed@um.edu.my

Value management (VM) practices have been expanded and became a well-received technique globally. Organisations are now progressing towards a better implementation of VM and should be assessing their strengths and weaknesses in order to move forward competitively. There is a need to benchmark the existing VM practices to reflect their maturing levels which is currently not available. This paper outlines the concept of Value Management Maturity Model (VM3©) as a structured plan of maturity and performance growth for businesses. It proposes five levels of maturity and each level has its own criteria or attributes to be achieved before progressing to a higher level. The framework for VM3© has been developed based on the review of literatures related to VM and maturity models (MM). Data is collected through questionnaire surveys to organisations that have implemented VM methodology. Additionally, semi-structured interviews were conducted to select individuals involved in implementing VM. The questions were developed to achieve the research objectives; investigating the current implementation of VM and, exploring the organisation's MM knowledge and practices. However, this research was limited to VM implementation in the Malaysian government's projects and programmes. VM3© introduces a new paradigm in VM as it provides a rating method for capabilities or performance. It is advocated that this VM3© framework is still being refined in the advance stage in order to provide a comprehensive and well accepted method to provide ratings for organisations' maturity.

Keywords: *Value Management, Maturity Model, government project*

1. INTRODUCTION

Value management (VM) practices have been expanded and became a well-received technique globally (Fong & Shen, 2000) and widely implemented in various industries such as automotive, aerospace, construction, petroleum, process control, defence, chemicals, services, healthcare, food, communications, consumer products as well as government (Kaufman, 2001). Prior to 2011, the practice of VM in Malaysia was said to be at its initial stage of its existence (Ong, 2003; Jaapar et al, 2009). However, organisations are now progressing towards a better implementation of VM and should be assessing their strengths and weaknesses in order to move forward competitively.

At present, VM is widely accepted and practised in many countries. For example, the US government has mandated that all projects that costs USD2 million or more must adopt VM study (commonly known as value engineering or VE in the US) whereas its Department for Transport (DfT) has been more stringent, making it compulsory for projects as low as USD100 thousands (Kaur, 2012). Meanwhile, Kim et al (2010) asserts that the South Korean Ministry of Land, Transport and Maritime affairs has made it mandatory to apply VM for construction projects of KRW10 billion (USD10 million) or more. The Japanese government has also mandated the use of VM for projects costs JPY175 million (USD2 million) or more and the Australian government implemented VM for its federal projects costs of at least AUD5 million (USD4.5 million).

2. VALUE MANAGEMENT IMPLEMENTATION IN MALAYSIA

In 2011, the Prime Minister of Malaysia has revealed that the implementation of VM in the Malaysian construction industry recorded savings on the initial project cost by between 10 to 30 per cent (Bernama, 2011). He added that the application of VM has become integral to the construction industry and the process seeks to provide maximum returns on a project from well-managed costs. In Malaysia, it is compulsory for any Government projects and programmes which cost MYR50 million (USD15 million) or more to implement VM. The Economic Planning Unit (EPU) of the Prime Minister's department establishes a dedicated unit called VM Section to take charge on the implementation of VM for projects. Mahalingam (2010) advocates such move by the Malaysian government and further recommends that the application and practice of VM should be on all projects rather than focusing on the projects above MYR50 million. Meanwhile,

the application of VM has also been made mandatory by two of the Government-Linked Companies (GLCs). Tenaga Nasional Berhad (TNB), which is the national power provider has made it compulsory for any projects that cost MYR10 million (USD3 million) or more, while the Malaysia Airport Holdings Berhad (MAHB) has implemented VM for any projects with a minimum cost of MYR300 thousands (USD90 thousands). It was reported that the implementation of VM will save the government's expenditure by 20 to 30 per cent while enhancing the speed for the project completion (Bernama, 2010), ensuring that the projects under the 10th Malaysian Plan (10^{th} MP) will be completed on time.

3. THE CONCEPTS OF MATURITY AND MATURITY MODEL (MM)

Maturity model (MM) acts as a structured framework for the revolutionary growth of performance within projects or programmes in organisations. It helps in assessing the organisational strengths and weaknesses and in bringing the organisation to the next level of maturity or achievement in accordance to the goal to be achieved. It is not necessary for an organisation to reach the highest level of maturity, as it depends on the capability of the organisations. The continuous assessment and practices are important to make sure the organisation is maintained at its level of maturity.

Kohlegger et al. (2009) defined maturing as the change of the maturing subject in formality, distribution, commitment, legitimation, understandability and teachability. Meanwhile, Khoshgoftar and Osman (2009) pointed out that maturity model provides a structured framework for improving an organisation's business results by assessing its strengths and weaknesses, enabling comparisons with similar organizations to benchmark. The maturing approach has been known to be analytic, explanatory or normative concept in the several domains. MMs are usually utilised by companies or organisations to identify the best practice and to compare the methods of working as well as the quality of outputs or outcomes (Khoshgoftar & Osman, 2009). Kohlegger et al. (2009) pointed out that MM is a well-known instrument or technique used to rate the capabilities or performance of maturing elements, and appropriate actions to bring the elements to a higher level of maturity. The process of maturity modelling originated in the manufacturing industry (Finnemore et al, 2000), based on Deming's concept of process improvement and Crosby's (1979) quality management maturity grid. MM is based on the different issues like the premise that an organisations' productivity will be increased when the business processes and staff capability are improved.

Developed as a sequential model, MM assists in structuring the analysis of existing organisational and technical infrastructures to support the goal-directed learning on a collective level (Kohlegger et al, 2009). It has two dimensions, consists of the MM and the areas which the levels are applied (Santana, 2007). Klimko (2001) has suggested that MM should consists of a few structured stages or levels, about four to six to be as guide in running projects or programmes. Each stage or level of the model shall have certain requirements that the organisations have to fulfilled and maintained before moving to the next level. The shifting from one level to another has to be in sequence so that the performance can be assessed accordingly. Klimko (2001) summarises the properties of MM as follows:

1. A limited number of maturity levels (four to six levels).
2. Each maturity level has its own requirements which the entity has to achieve on the particular level.
3. Levels of maturity are in ordered sequentially, from the initial to the final level.

It might be difficult for an organisation to start implementing MM. Figure 1 indicated that the initial stage is the very early whereby ad-hoc processes started, being defined and standardised before it can be managed. At this stage, organisations depend very much on individual competencies and the process cannot be repeated unless the same competent individuals are assigned to the next project (Paulk et al, 1993). Furthermore, the process must be optimised and be continuously improved through feedback and other innovative ideas and technologies before moving to the next level.

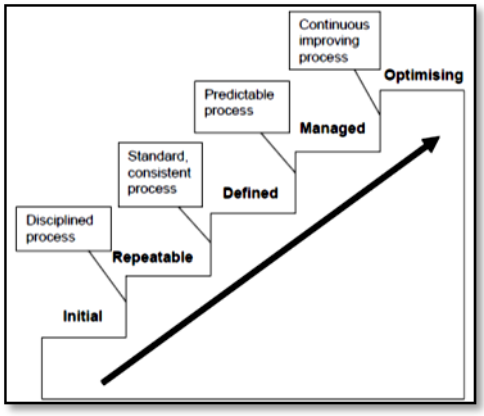

Figure 1: Five levels of maturity process
(Source: Adapted from Paulk et al., 1995)

Table 1: Examples of maturity model available

No.	Maturity Model	Acronym
1	Automated Software Testing Maturity Model	ASTMM
2	Capability Maturity Model for Software	SW-CMM
3	Capability Maturity Model Integration	CMMI
4	Configuration Management Maturity Model	-
5	Earned Value Management Maturity Model	EVM3
6	Information Process Maturity Model	IPMM
7	Integrated Product Development Capability Maturity Model	IPD-CMM
8	IT Architecture Maturity Model	-
9	Information Technology Infrastructure Maturity Model	ITI-MM
10	IT Service Capability Maturity Model	IT Service-CMM
11	Operations Maturity Model	OMM
12	Organizational Project Management Maturity Model	OPM3
13	Outsourcing Management Maturity Model	-
14	People Capability Maturity Model	P-CMM
15	Performance Engineering Maturity Model	PEMM
16	Portfolio, Program and Project Management Maturity Model	P3M3
17	Programme Management Maturity Model	
18	Project Management Maturity Model	PMMM
19	Service Integration Maturity Model	SIMM
20	Risk Management Maturity Model	RMM
21	Software Engineering Capability Maturity Model	SE-CMM
22	Software Reliability Engineering Maturity Model	-
23	Testing Maturity Model for Quality Assurance	TMM
24	Web Services Maturity Model	-
25	Website Maturity Model	-

There is no global standard for MM as it is a new concept and both researchers and companies need further considerations and clarifications (Khoshgoftar & Osman, 2009). Table 1 provides examples of varying maturity models available in the market. Kohlegger et al (2009) revealed that there are over 70 different MMs from domains within the spectrum of business information systems and computer science, thus showing the great variety and widespread of MMs available in the literature. Additionally, they argued that although there are many models available, these models differ with respect to their characteristics and therefore a deeper understanding is crucial prior to developing or revising a maturity model.

4. THE RESEARCH

This research aimed to develop the concept of Value Management Maturity Model or VM3© as a structured plan of maturity and performance growth among Malaysian Government projects and programmes, towards a high quality products or achievement. This is achieved by investigating the current implementation of VM among Malaysian Government projects and programmes; reviewing the existing MMs and the tendencies to be implemented in improving value among government organisations; and also exploring the government organisations' practices in implementing MM and their current level of maturity. The research scope is limited to the Malaysian Government organisations located within Kuala Lumpur and Putrajaya, two of the Federal Territories of Malaysia. The organisations involved are the government departments or ministries, Government-Linked Companies (GLCs), Government-Owned Companies (GOCs) and private companies engaged with government projects or programmes. Additionally, the respondents for this research are among those who have known at least basic knowledge about VM. This is to make sure that they understand the purpose of VM and the importance of implementing it. Data for this research was collected through the distribution of questionnaire surveys and interviews to the particular organisation. Interviews have been conducted with the particular persons of selected organisations in exploring the knowledge and information about their current organisations' performance and the improvements they are working for.

5. PRELIMINARY WORK FOR VM3© FRAMEWORK

At present, the method to measure the performance of organisations or projects that implement VM is found to be lacking. Therefore, this research is carried out to develop a specific MM for VM implementation. In doing so, six available MMs were reviewed, namely, Portfolio, Programme and Project Management (P3M3), Organisational Project Maturity Model (OPM3), People Capability Maturity Model (P-CMM), Earned Value Management Maturity Model (EVM³), Information Technology Infrastructure Maturity Model (ITI-MM) and Risk Maturity Model (RMM). Although these MMs are directed to different areas, the research found that they have similarities in that their implementations are in accordance with the organisations' objectives and the sector which they concern. Cooke-Davies et al (2001) argued that different MM has different concepts and suggestions, but all of them are goal-oriented for maturity. Nonetheless, these models are adopted by organisations in the area of project management as well. Therefore, these MMs are chosen considering their functions, levels, suitability and benefits. The comparisons between six MMs are shown in Table 2.

Table 2: Comparisons of six maturity models

Criteria	**P3M3 (Portfolio, Programme and Project Management)** OGC (2010)	**OPM3 (Organisational Project Maturity Model)** Bull (2007)	**P-CMM (People Capability Maturity Model)** SEI (2007)	**EVM3 (Earned Value Management Maturity Model)** Management Technologies (2000)	**CMMI (Capability Maturity Model Integration)** Hasyim (2005)	**RMM (Risk Maturity Model)** Hillson (1997)
Developer/ Owner	Office of Government Commerce (OGC), UK	Project Management Institute (PMI), USA	Software Engineering Institute (SEI), Carnegie Mellon University	Management Technologies, Brea, California, USA	Software Engineering Institute, Carnegie Mellon University	HVR Consulting Services Limited, UK
Domains	1. Project 2. Program 3. Portfolio	1. Project 2. Program 3. Portfolio	1. Workforce shaping 2. Performance motivation & management 3. Workgroups & culture building 4. Competency development	1. ANSI/EIA – 748 Earned Value (EV) Data 2. EV Time Phased Incremental Cost and Quantity Data 3. Management Reserve Data 4. Schedule Data 5. Variance Analysis Narrative	1. Software Engineering (CMMI-SW) 2. System Engineering (CMMI-SE) 3. Integrated Product and Process Development (CMMI-IPPD) 4. Supplier Sourcing (CMMI-SS)	1. Policies and leadership 2. Resources and training 3. Activities performed 4. Measurement and analysis 5. Verification of implementation
Maturity Levels	1. Awareness 2. Repeatable 3. Defined 4. Managed 5. Optimised	1. Standardise 2. Measure 3. Control 4. Continuously Improve	1. Initial: Inconsistent management 2. Managed: People management 3. Defined: Competency management 4. Predictable: Capability management 5. Optimising: Change management	1. Initial 2. Localized/ Partial Implementation 3. ANSI/EIA 748 Compliant Implementation 4. Quality measuring of EVM data 5. Constant improvement	1. Initial 2. Repeatable 3. Defined 4. Managed 5. Optimizing	1. Naive: Not implementing any process for managing risk 2. Novice: Professional advice is taken & standard guidance to initiate is followed 3. Normalised: Simple common-practice, routine reviews 4. Natural: Selection of risk-efficient strategic choices

Assessment	1. Self-assessment 2. Formal review	1. Self-assessment 2. OPM3 Product Suite	1. Self-assessment 2. Mentored Self -Assessment 3. Interim Profile 4. Mini-assessment 5.CBA-IPI 6. SCE 7. SCAMPI	1. Internal assessments - self-assessment - current level - steps to reach next level 2. External formal evaluations - independent EVMS process review - contractor or teammate qualification	1. Mini-assessment 2. Process Snapshot 3. Process Mapping	1. Self-assessment (questionnaires)
Areas/ Principles	1. Management Control 2. Benefits Management 3. Financial Management 4. Stakeholder Engagement 5. Risk Management 6. Organisational Governance 7. Resource Management	1. Knowledge 2. Assessment 3. Improvement	1. The targeted domain of processes 2. Total quality 3. Management practices Organisational change	1. Planning Process Area 2. Accounting Process Area 3. Analysis Process Area 4. Revision Process Area 5. Measurement Process Area	1. Foundation 2. Acquisition 3. Development 4. Services	1. Stakeholders 2. Risk identification 3. Risk analysis 4. Rick responses 5. Project management 6. Culture
Strengths	1. Justifies investment in portfolio, programme or project management improvements 2. Raises recognition of service quality 3. Gains better understanding of the strengths and weaknesses to enable improvements	1. Helps organisations to identify and deliver the right project to advance their strategy 2. Improves project performance and return on investment 3. Helps to align an organisation's strategy that sustain business success 4. Mitigates operating costs	1. Develops individual capability 2. Builds workgroups and culture 3. Motivates and manages performance 4. Shapes the workforce 5. Reduces the variations in performing best practices 6. Improves the practice continuously to enhance capability 7. Transfers the best practice rapidly across groups 8. Practices can be repeated. Curtis et al (2009)	1. Raises the stockholder and analysts' perception of company health 2. Increases business 3. Helps in managing more business with current assets	1. Leads to business success 2. Cost-effective 3. Keeps improving 4. Works well with technologies 5. Solid reputation 6. Good track record 7. Has already been experienced by many users SEI (2012).	1. Helps to assess the current level of risk management capability 2. Identifies realistic targets for improvement 3. Produces action plans for enhancing risk management capability maturity model

Based on these comparisons, this research found that the differences of the maturity levels are motivated by the purpose of the MMs. They are compared to identify their suitability to be adopted in developing the VM3© framework. From the six (6) MMs, it was found out that P3M3 is the most suitable reference to be considered as a basis to construct and develop the VM3©. It is also chosen in terms of its purpose which is to improve value for money, and to escalate standards. Prior to this, five (5) levels of maturity are chosen in outlining the VM3© and the keywords for Level 1 to Level 5 are chosen based on the suitability towards maturity.

6. METHODOLOGY

The preliminary framework above has to be refined to developed and structure the VM3© processes. Questionnaire surveys and semi-structured interviews are carried out to obtain more findings. The questionnaire was developed based on the information from the review of literatures related to VM and MM, consistent with the research objectives. The respondents were those who have the awareness and knowledge of VM and are informed about the general concept and the benefits of VM.

They are from various government departments or ministries, GLCs, GOCs, as well as the private companies engaged with government projects or programmes. These organisations are located within Klang Valley and Putrajaya. A total of 100 sets of questionnaires have been distributed and the contact details were obtained from the organisations' website as well as from the personnel's individual network, also known as the snow-balling method. The research managed to get 30 responses whereby 57% (17) of them were from the government department or ministries, 33% (10) from private organisations and 10% (3) were from the GLCs.

7. RESULTS AND ANALYSIS

The research found out that majority of the respondents has experiences in VM, whereby 60% of them have at least five years experiences and 24% have between six to fifteen years of experiences. This shows that the majority of them are well aware about the processes and practice of VM in the industry. Additionally, the position of the respondents in their respective organisations or departments are also been analysed. This is to investigate their role within the organisation, whether they are among the senior, middle or junior management. From the survey, the research found out that majority of the respondents were from the middle management of an organisation or department, with 11 respondents are from the middle management and 10 respondents are from the junior management. This is followed by the senior management with a total of seven respondents.

7.1 CURRENT IMPLEMENTATION OF VM

The respondents were asked about their opinions on the effectiveness of the VM process they had gone through, to identify if there is any a problem or inadequacy of the VM process. The results are as shown in Table 3. From the results, 45.8% indicated that it was very effective while 50% said that it was effective. This cuts the majority of respondents saying the VM process is effective.

The research also investigated the successfulness of a project or programme which has implemented VM. Table 4 shows the result of the VM implementation among the respondents' organisations. It was found out that 91.7% of the respondents indicated that VM implementation has positive influences to the success of their projects or programmes. Meanwhile, 8.3% respondents who stated that the success of their projects or programmes were just an average.

Next, they were asked on their organisations' current level of understanding and practices of VM in accordance to the proposed level of maturity. The level we based is on the organisations' current practice. Results of the analysis are shown in Table 5.

Table 3: Effectiveness of VM process

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very effective	11	36.7	45.8	45.8
	Effective	11	36.7	45.8	91.7
	Average	2	6.7	8.3	100.0
	Total	24	80.0	100.0	
Missing System		6	20.0		
Total		30	100.0		

Table 4: Success of projects/programmes through VM implementation

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very good	11	36.7	45.8	45.8
	Good	11	36.7	45.8	91.7
	Average	2	6.7	8.3	100.0
	Total	24	80.0	100.0	
Missing System		6	20.0		
Total		30	100.0		

Table 5: Current level of VM understanding /practices

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Aware/Initial	1	3.3	4.2	4.2
	Repeatable	4	13.3	16.7	20.8
	Defined	4	13.3	16.7	37.5
	Managed	8	26.7	33.3	70.8
	Continual improvement	7	23.3	29.2	100.0
	Total	24	80.0	100.0	
Missing System		6	20.0		
Total		30	100.0		

Based on the research, the current level of VM understanding and practices are found to be varied. Only one respondent (4.2%) said that he/she is at the awareness or initial level of understanding. Four respondents (16.7%) said that their organisations are at the repeatable and defined level of understanding respectively. On the other hand, 33.3% of the respondents' organisations are at their managed level while 29.2% are at the continuous improvement level of VM practices.

7.2 IMPLEMENTATION OF MATURITY MODELS FOR PROJECTS AND PROGRAMMES

From the survey, the research found that the respondents were not aware about MM, represented by 80% from 30 respondents. Only six respondents mentioned that they have heard about MM from articles, the seminar attended and from the internet. When they were asked whether they had ever gone through MM process, no one has gone through the process. Similarly, the respondents also mentioned that their organisations have never implemented any MM process for their projects or programmes. Therefore, the survey was continued to other audit system that is being implemented in their organisation in order to identify their technique for performance improvement.

7.3 OTHER METHODS TO MONITOR PERFORMANCE FOR PROJECTS AND PROGRAMMES

Based on the survey, 53% or 16 of the 30 respondents said that their organisations are implementing a system in maintaining and improving their organisations' performance while the remaining 47% said that they are not applying any. The research found that ISO9000 is the most common standard adopted by the organisations. Other methods are benchmarking, key performance indicator (KPI) and brainstorming sessions. They were also asked on the organisations' strategies to maintain their performance towards achieving the goals of the organisation. Hewitt's Survey is one of the tools used to monitor their performance. Besides that, there is also Customer Relationship Management (CRM) strategies adopted to achieve their customer's satisfaction while other respondent mentioned that they just maintain the performance and satisfy the customers or clients' needs in order to provide a quick service and value for money. In addition, the research also found that there are units or sections within their organisation that inspects and monitors the organisation's performance. A correlative analysis was conducted on the performance growth and audit system to check whether there is any significant correlation between them. The result showed that the latest report on performance growth has significant with the implemented audit system by the organisations. Therefore, the organisations should implement the best system to measure and monitor the organisation's performance from time to time.

7.4 RESULTS FROM THE INTERVIEWS

For this research, interviews act as the secondary data and conducted due to strengthen the questionnaire survey. Eight interviews have been conducted from different organisations to gain more information or opinions about VM or MM. Out of the eight interviewees, only one of them is capable of explaining and sharing knowledge about

MM. The outcomes of the interview sessions are as follows:

Stages in VM process

It was clearly mentioned by six interviewees that the government practices a specific approach of VM for all projects and programmes. Lead by the Economic Planning Unit (EPU) of the Prime Minister's Department, the process of VM is divided into three stages. EPU itself will conduct the first stage, called Value Assessment (VA). The second stage is the Value Engineering (VE) process, which is conducted by the Public Works Department (PWD) through the Complex Projects Branch or PROKOM. This is where all the data are collected and detailed designs are obtained from the relevant parties. However, VE will only take place once VA has been completed and approved by the EPU. The third process is Value Review (VR) and it is being led by the National Audit Department. The research found that the government adopts different terminologies from those suggested by the Institute of Value Management Malaysia (IVMM) whereby IVMM uses Value Planning (VP), VE and VA in its documents.

MM implementation

The research found that MM has not been accepted as a practice by the organisations. Only interviewee 8 discussed regarding MM in his organisation, saying that they were just started the research on MM a couple of months back and the proposal has yet to be forwarded to the higher management. They have considered three existing project management based MMs as reference, namely, P3M3, PRINCE2 and PMMM. According to him, CMMI has been implemented by the Multimedia Development Corporation (MDEC) under the Multimedia Super Corridor (MSC) Malaysia to develop a programme named, Capability Development Programme (CDP) CMMI programme. It is to create the awareness about the CMMI Model among the MSC Malaysia organisations to be successfully appraised with the CMMI Maturity Level Rating. Currently, there are organisations which have been rated Level 5, Level 3 and Level 2 under the programme.

8. FINDINGS

The research compares six (6) maturity models, of which P3M3 was chosen as the source to develop the VM3©. This is due to the nature, concept of understanding and terminologies of P3M3 that are similar and suitable, which will improve the value for money by driving up standards and capability in the industry. It consists of five (5) levels, awareness, repeatable, defined, managed and optimised. It includes the principles of financial management, risk management and organisational governance, to name a few. Moreover, its strengths are to justify investment improvement, to raise service quality recognition and to gain better understanding on strengths and weaknesses to enable improvements. The proposed structured levels of VM3© is as shown in Figure 2.

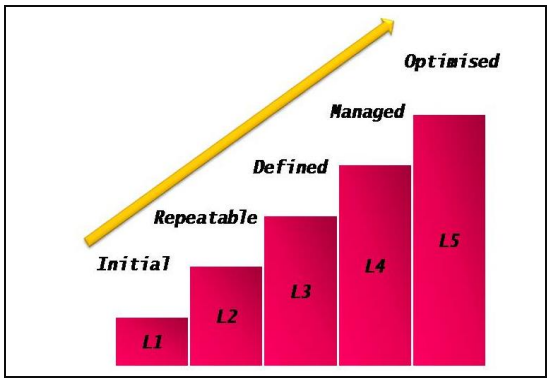

Figure 2: The outlined Value Management Maturity Model (VM3©)

VM3© is structured with five (5) levels of maturity, namely the awareness, repeatable, defined, managed and optimised levels. Each level has its own criteria that have to be achieved before an organisation can shift to a higher level. The blue lines between the maturity levels represent the processes that the organisation has to face before allowing itself to a higher level of maturity. The definition of each maturity level is as follows:

1. Initial level: The organisation is aware about VM but does not have documented processes on VM.
2. Repeatable level: The organisation has started to implement VM as a common-practice.
3. Defined level: The organisation has defined VM within the organisation to steer for improvement.
4. Managed level: The organisation has established the effective strategies and processes in line with the medium and long-term plans.
5. Optimised level: The organisation has the initiatives to optimise the improvement of VM practices.

There are four key elements of VM at each level, comprising the organised effort, analysing on the necessary function, satisfying the requirements or attributes to achieve the function with most profitable cost must be practised at every level of VM3©. In shifting to a higher level, the

organisation must first go through the process of disciplined process between initial and repeatable levels. This follows by the standard and consistent process, predictable process, as well as continuous improving process at shifting to a higher level of maturity, as shown below:

a) Level 1 to Level 2:Disciplined process

At this stage, the organisation must have disciplined in practising the knowledge about VM and further implement it into a documented process. As the result, the VM practices will be more assessable and systematic.

b) Level 2 to Level 3:Standard or consistent process

Shifting the organisation from Level 2 and Level 3 needs the organisation to be standardised or consistent with the VM practices. Thus, the target for improvement or maturity for respective key areas must be drafted to ensure the direction of performance and maturity of the organisation. The key areas may consist of risk management, organisational governance, and financial management.

c) Level 3 to Level 4:Predictable process

It is the process where the strategies of an organisation are planned to achieve the goal or target for performance or maturity in the respective rating areas. Therefore, Level 4 is the level where the whole organisation shall work on the strategies outlined for the organisation.

d) Level 4 to Level 5:Continuous improving

The process of continuous improving is vital to ensure that the organisation is matured enough to do any improvement regarding the VM practices, before being able to be optimised at Level 5.

9. CONCLUSIONS

The research has outlined a structured framework of VM3© as a plan of maturity and performance growth for the Malaysian government projects and programmes, towards high quality products or achievement. The research discovered that most of the respondents acknowledged about VM but not MM. Hence, more research on MM should be done to increase the sources of MM researches in various areas of industries in the future. Besides, the research provides the gateway for future researchers to explore in depth about VM3© as it is outlined to be the structured plan of maturity and performance growth for projects and programmes, towards high quality products or achievement. This research has strengthened the previous research especially regarding to VM and MM. It provides the effective results and input into the VM and MM mainly for the Malaysian government projects and programmes. The research sets to contribute to the industry theoretically and practically. Firstly, the research provides an alternative method of rating for VM maturity and performance growth. Secondly, many researches have been conducted in relation to VM and MM. However, there was no research conducted that considers VM maturity. Therefore, this research makes the extension to a new paradigm in which MM has been introduced to get along with VM. Thirdly, the insertion of VM along the structured levels of MM results in the formulation of VM3©. The outline of VM3© introduces an improvement in the VM area in order to create a structured plan for an organisation in implementing VM.

REFERENCES

Bernama. (2010, 20 April). Minister: 10MP requires value management analysis on programmes.

Bernama. (2011, March 14). Application of Value Management is Important, says PM. *Official Portal of the Prime Minister of Malaysia*. Retrieved from http://www.pmo.gov.my/?menu=newslist&news_id=6505&news_cat=13&cl=1&page=1731&sort_year=2011&sort_month=

Bull, L. (July, 2007). *An Introduction to OPM3® and Supporting Models. EFCOG Project Management Working Group Summer Meeting*. Albuquerque, NM: Project Management Institute.

Cooke-Davies, T. J., Schlicher, F. J. & Bredillet, C. (2001). Beyond the PMBOK Guide. In *Proceedings of the 32rd Annual Project Management Institute 2001 Seminar and Symposium Philadelphia, Philadelphia.*

Crosby, P. B. (1979). *Quality is free: The art of making quality certain*. New York: McGraw-Hill Book Company.

Finnermore, M., Sarshar, M. & Haigh, R. (2000). Case studies in construction process improvement. In Proceedings of the ARCOM Construction Process Workshop, 16 February 2000, Loughborough University, Loughborough.

Fong, S. W. & Shen, Q. P. (2000). Is the Hong Kong construction industry ready for value management. In *International Journal of Project Management*, 18. pp. 317-326.

Hillson, D. A. (1997). Towards a risk maturity model. *The International Journal of Project and Business Risk Management, 1(1), 35-45.*

Jaapar, A., Endut, I. R., Ahmad Bari, N. A. & Takim, R. (2009). The Impact of value

management implementation in Malaysia. *Journal of Sustainable Development*, 2(2). pp. 210-219.

Kaur, G. (2012). The value management advocate. *Malaysian Business.* June 1, pp.36-38. Kuala Lumpur: Berita Publishing.

Khoshgoftar, M. & Osman, O. (2009). Comparison of maturity models. In 2nd IEEE International Conference on Computer Science and Information Technology, 5, 297-301.

Kim, S., Lim, J., Kim, J., & Cheon, Y. (2010). Application of value analysis for SOC project in Korea. In *SAVE International's 50th Annual Conference*, 7-10 June 2010, Long beach, California.

Klimko, G. (2001). Knowledge management and maturity models: Building common understanding. *Proceedings of the 2nd European Conference on Knowledge Management*.

Kohlegger, M., Maier, R. & Thalmann, S. (2009). Understanding maturity Models results of a structured content analysis. In *Proceedings of I-KNOW 2009 and I-SEMANTICS 2009, 2-4 September 2009, Graz, Austria.*

Mahalingam, E. (2010, May 3). Value management analysis lauded. *The Star Online*. http://biz.thestar.com.my/news/story.asp?sec=business&file=/2010/5/3/business/6158916

Management Technologies. (2000). *Earned Value Management Maturity Model (EVM³®)*.

Office of Government Commerce (2010). *Portfolio, programme and project management maturity model (P3M3®) – Project Model.* London.

Kaufman, J.J. (2001). *Value management:Creating competitive advantage*. Canterbury: Financial World.

Ong, H. T. (2003). In *6th Hong Kong Institute of Value Management (HKIVM) International Conference, 26-27 November 2003, Hong Kong Convention Centre, Hong Kong.*

Paulk, M., Weber, C., Curtis, B. & Mary-Beth, C. (1995). *The capability maturity model: Guidelines for improving the software process*. USA: Addison-Wesley Longman Inc.

Paulk, M.C., Curtis, B., Mary-Beth, C., & Weber, C.V. (1993). Capability Maturity Model, Version 1.1. *IEEE Software*. July, pp 18-27.

Santana, T. R. (2007). Developing a maturity model for IT alignment in a cross-organizational environment. In *SIKS Proceedings of the 2nd Dutch/Belgian Conference on Enterprise Information Systems (EIS 2007), Groningen, Netherlands.*

Software Engineering Institute. (2007). *Overview of the people capability maturity model (P-CMM)* (2nd edition). *Carnegie Mellon University, Pittsburgh*.

Software Engineering Institute. (2009). *People capability maturity model (P-CMM)* (2nd edition). *Carnegie Mellon University, Pittsburgh*.

Software Engineering Institute.(2012). Capability maturity model integration (CMMI). Retrieved 2 Feb 2012, from http://www.sei.cmu.edu/cmmi/