Comparison of Maturity Models

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Abstract
Maturity models are one of the widespread areas in the field of improving organizational performance. Maturity models identify organizational strengths and weaknesses in addition to providing benchmarking information. Project management maturity models are important assessment tools for the profession. Companies assess their organizational performance and identify their weaknesses and strengths in terms of their needs and objectives and also characteristics of the models. The important issue here is that construction companies can assess their organizational performance by a comprehensive and useful model. This can help them compare their situation with other companies by using the same model. There are many maturity models like OPM3, P-CMM, CMMI, OPMMM, TMM, P3M3, SPICE, BPMM, FAAiCMM, (PM)2, Kerzner's Project Management Maturity Model, Ibbs and Kwak Maturity Model, RMMM, TMM, etc. The aim of this study is to find out the best maturity model for using in construction companies. We will discuss four maturity models (OPM3, Prince, CMMI, and BPMM) and compare them in terms of variables such as: Publisher, Project Manager, Scope, Number of Maturity Levels, Date of Issue, Detail, Definition of Maturity, Culture, Referring to Standard, Discrete and Continues, Assessment difficulty, Assessment cost, Quantitative Results, Tangible of Result, Identifying weakness and Strong points, Continues Assessment, Training, Flexibility, Organization Strategic, Acceptability of Model, Simple and Understandable, Easy for Execution. The result will show that OPM3 is the best maturity model among four maturity model considered.

Key words: Maturity Model, OPM3, Project Management Maturity Model

1. Introduction

1.1 History of Project Management Maturity Models

During the 1990s a number of organizational project management maturity models were proposed (Fincher and Levin 1997; Goldsmith, 1997; Ibbs and Kwak, 1997; Hartman 1998). Most were based on the PMI's Guide to the Project Management Body of Knowledge (PMBoK) and built on the SEI CMM's five level approach, as indeed have more recent models (e.g. Pennypacker, 2002).

One of the earliest that was put to practical use was Microframe's Project Management Maturity Model (also known as PM3) which was developed in 1997 by a team of project managers led by the Project Management Institute (PMI) and Microframe Technologies Inc. Closely based on SEI's CMM, it defined the 5 levels of maturity as: *ad hoc*, abbreviated, organized, managed and adaptive. Soon afterwards Ibbs and Kwak at Berkeley, University of California, developed their own model. Their five-level PM Process Maturity Model, initially known as (PM)2, was developed by adapting Crosby's maturity model (Crosby, 1979), SEI's capability maturity model (SEI 1993), McCauley's organizational maturity model (McCauley, 1993), and Microframe's project management

maturity model (PM3), as its basic references (Ibbs and Kwak, 1997). Their 5 levels were defined as: ad hoc, planned, managed, integrated and sustained. It is now called the Berkeley Project Management Process Maturity Models and is applied using Berkeley's own proprietary Project Management Maturity Assessment Tool (Ibbs and Reginato, 2002). Other models have moved away from a strict correlation to SEI CMM and the PMBoK. One is the Project Management Maturity Model (ProMMM), which has reduced the number of levels from 5 to 4 (Naive, Novice, Normalised and Natural) with each level further defined in terms of four attributes: culture, process, experience and application. Where the majority of models compare project management capability against standards set in the PMBoK, ProMMM includes other elements that contribute to project management capability such as important areas of organizational culture, human aspects such as skill and experience levels, and practical issues of implementation and application (Hillson, 2003).

The Project management Group at the University of Business Administration and Economics in Vienna developed a model of project management competence to help organizations self-assess and benchmark their organizational competence (Gareis and Huemann, 1998). This proposed that a 'spider's web' or radar-map using six axes was better than the 4-5 steps of traditional maturity models, because it allowed for a multi-dimensional representation of project management competence and allowed the maturities of different project management sub-processes to be visualized (Gareis and Huemann, 2002). Even those that stick to 5 levels and are closely aligned to the PMBoK can introduce different nuances. The Kerzner Project Management Maturity Model, for example, has 5 levels defined as: Common Language, Common Processes, Singular Methodology, Benchmarking and Continuous Improvement (IIL Inc. 2004). There is, inevitably, much greater variation in the number and the types of questions used in the various assessment tools that are used for each maturity model. There are also differences in the way assessments can or should be made, ranging from internal self-assessment or on-line personal assessment to external assessment conducted by management consultants.

1.2 New Maturity Models

In the UK, the Office of Government Commerce (OGC), which produces best practice guidance such as PRINCE2, Managing Successful Programs (MSP) and the Management

of Risk, identified the need for an organizational level assessment service, based on a formal project management maturity model, in 2000/2001 (OGC, 2004). OGC had received a number of requests from both public and private sector organizations wishing to use a recognized “kite mark”, such as the PRINCE2 logo, to demonstrate their achievement of standards relating to project management. Together, these Best Practices, Capabilities, Outcomes, and key performance indicators ,along with necessary narrative explanations, navigational guidelines, and description of the Organizational Project Management process, constitute OPM3. The PMI model is designed to help organizations assess the state of their organizational project management maturity and to help them plan the path to improvements. Assuming an organization wishes to improve, OPM3 is intended to help them determine what specific Capabilities they need to acquire to achieve the desired Best Practices, and in which order, so they can advance their agenda while conserving limited organizational resources (Fahrenkrog et al., 2003). However, members of the team warn, “While it (OPM3) can be a powerful reference and development tool, its effective use will require significant thought, digestion, application, analysis, and evaluation—not possible through just reading the standard.”

2. Maturity

According to the Oxford Advanced Learner’s dictionary maturity is: The quality of thinking and behaving in a sensible, adult manner (Of a person, an animal, or a plant), the state of being fully grown or developed, (Business) the time when money you have invested is ready to be paid, whereas, in Collins Dictionary, the adjective “mature” from which the noun “maturity” is derived has a number of different meanings in common usage. It can, for example, mean (1) fully-developed or grown up; (2) of plans or theories it can mean that they are fully considered, perfected; (3) of insurance policies or bills it can mean due or payable; and (4) of fruit, wine or cheese it can mean ripe or fully aged.

In this regard Andersen and Jessen (2003) define maturity as the quality or state of being mature. If taken into account the organization structure, the maturity concept must be related to a state in which organizations are in perfect conditions to achieve their goals (Berssaneti et al., 2008). They indicate that project maturity means that the organizations are completely ready to work their projects. Andersen and Jessen (2003) point out that concept of maturity to an organization it might refer to a state where the organization is in a perfect condition to achieve its objectives. It is necessary to highlight that in the real

world we will not find the fully matured organization; no one has reached the stage of maximum development and no one will. Therefore it makes sense to talk about a certain degree of maturity and make an effort to measure or characterize the maturity of the organization.

According to Cooke-Davies (2004) the definition of maturity in the capability-maturity family of models leads to the clear conclusion that more mature organizations measure different things than immature ones, and can also expect the measures to show improving results as the organization increases in maturity. The definition of maturity in many of the more popular project management maturity models, however, does not make this distinction. The same things are measured at all levels of maturity; it is simply the results that improve with maturity. (Cooke-Davies, 2004)

Andersen and Jessen (2003) adopt a broad definition of maturity, including both behavior and competence. Our view is that maturity within the business community is best explained as the sum of action (ability to act and decide), attitude (willingness to be involved), and knowledge (an understanding of the impact of willingness and action). The triangle (action, attitude, knowledge) is originally based on research in consumer behaviour (Simon, 1955), later enhanced by Williamson (1985) and March (1989) and empirically debated by Helgesen (1992).

3. Maturity Model

One of the models which have gained a lot of attention in the project management community is maturity models and almost every larger project management organization has published some kind of a maturity model. Maturity models are formed based on different issues like the premise that improving business processes and staff capability will improve an organizations' productivity. According to the Jugdev and Thomas (2002) maturity models identify project or organizational strengths and weaknesses and benchmarking information.

Accordingly, Andersen and Jessen (2003) highlight the term "maturity" in projects should be used as a sign or ability to measure an organization in using projects for diverse purposes. As shown in the PMI, there are many maturity models. Those models indicate that there are differences amongst companies in execution of projects and means of

achieving goals. However, many of these models are scope limited; therefore they have as their own goal the categorization of an organization's behavior.

4. Significance of Maturity Models

Over the last twenty years, such pressures have led to the widespread use of metrics, benchmarks, benchmarking, and now, maturity models, as a means to identify best practice and to compare methods of working and the quality of outputs or outcomes (Harapham, 2006).

Furthermore, a variety of claims have been made related to the benefits that organizations have obtained from using particular maturity models e.g. (Suares, 1998; Rosenstock, Johnston, Anderson, 2000; Peterson, 2000). The implications are that mature organizations are up to:

- Manage all the projects undertaken by an organization effectively (Suares, 1998)
- Improve continually the performance of all projects undertaken by an organization (Peterson, 2000), and
- Improve dialogue between the project management community and organizational top management (Peterson, 2000)

5. Shortcomings of Maturity Models

It has been argued clearly (Crawford 1998; Crawford 2001; Morris 2001; Crawford 2002; Morris 2003) that the absence of global standards is a disadvantage of the practice of managing projects in multi-national or global organizations. Exactly the same argument is relevant to maturity models. The absence of a generally accepted definition of what is involved reduces the value of any maturity model in an organization. (Cooke-Davies, 2004)

These are all desirable benefits, although by warning that maturity models may not be the "silver bullets" that some are looking for them. Jugdev and Thomas (2002) examine maturity models from four different resource-based models perspectives in order to assess whether having a higher maturity level in project management bring competitive advantage to an organization or not. Their article concludes that maturity models have some characteristics but not all of a strategic asset, thus cannot present competitive advantage. This conclusion based on their observation that although "maturity models are a component of project management [but] they are not a holistic representation of the discipline."

The maturity models also have some limitations from a theoretical perspective. They are based on software maturity models that lack a theoretical basis (Jugdev and Thomas, 2002).

6. Project Management Maturity Models

According to Kerzner and the International Institute for Learning (IIL) see project management as a core competency that many companies must develop in order to remain competitive in the market. In this view, project management maturity models are an important strategic tool for senior management (Kerzner, 2001) that allows an organization to benchmark its capabilities in respect of project management with its competitors. As such, a project management maturity assessment model is a tool for establishing project management excellence, which is considered a condition for success.

Therefore, A Project Management Maturity Model is a measure of its effectiveness in delivering projects and also a tool for benchmarking capabilities project management that helps organizations to achieve specific project management competence. In the next section the importance of project management maturity models is going to be discussed in details.

7. Significance of Project Management Maturity Model

In the introductions to two of the more recent project management maturity models, PMMM and OPM3, the benefits that are to be expected from using the models to improve maturity also include:

- The creation of an organization-wide ability to manage projects according to the standard, defined project management processes that can be tailored to meet the specific needs of individual projects.
- Roles and responsibilities for conducting all project related activities are defined and are clear throughout the organization.
- Provide the organization with project information from the former projects on which to evaluate project schedules and budgets, ensure they are practical and review project performance. (Office of Government Commerce, 2002)
- Enables the organization to move forward its strategic goals through the use of project management principles and practices. In other words it bridges the gap between strategy and individual projects. (Project Management Institute, 2003).

Project management maturity models are frameworks built on top of the project management body of knowledge. By adopting project management maturity model an organization can systematically plan its project management capabilities and benchmark its performance against competitors and industry standards (Supic, 2005).

Although the terminology is different and not standardized, Suapic (2005) indicated that all models are building around the idea of maturing thought the following basic stages:

- Standardize
- Measure
- Control
- Continuously improve the process

8. Shortcomings of Project Management Maturity Model

A number of concerns have been expressed about this proliferation of project management maturity models, for example: “Unfortunately, there is no consensus as to the contents of an organizational project management maturity model, or even the principles on which such a standard is constructed” (Cooke- Davies et al, 2001).

Furthermore, in a searching for practical and theoretical limitations of project management maturity models, Thomas and Jugdev mention some criticisms of them (Thomas and Jugdev 2002) and conclude that “maturity model are a component of project management, but not a holistic representation of the discipline.”

Their article was published before the newest maturity models such as organizational project management maturity model OPM3 and project management maturity model was launched, but the newer models do not considerably affect the thrust of their argument, which is directed as much against capability-maturity models when they are used for the management of projects as it is against project management maturity models.

9. Comparison

As the maturity models are different from one another and each with a specific characteristics and factors and also there is no standard related to them. This study selected variables for comparing maturity models adapted by Hakamian (2005) with each other (Table1). These study also select four maturity model randomly for comparision. These maturity models are OPM3, P3M3, CMMI, and BPMM. The following variables

selected by considering the definition of maturity, factors and characteristics of the models, role and function of the models, and definition of project management.

1- Publisher: The reliable publisher

2- Scope: The cover of the area of model

3- Number of Maturity Level: The quantity of maturity level of model

4- Discrete and Continues: Consisting of the maturity level

5- Details: The amount of the considered factors

6- Date of Issue: The publications from 2000 to 2007 will be taken in to consideration in the study

7- Refer to Standard: Based on which standard the model is designed

8- Definition of Maturity: Definition of maturity

9- Culture: Determining of the application

10-Project Management Process: The covering project management process

11-Program Management Process: The covering program management process

12-Portfolio Management Process: The covering portfolio management process

13-Assessment Difficulty: The extent of difficulties

14-Assessment Cost: Expenditure of assessment

15-Identifying weakness and strong points: Indicating weaknesses and strongest of organization

16-Training Difficulty: The extent of difficulties in training of the model for staff and assessors

17-Operation: Ability of Execution

18-Commitment for Continuous Improvement: Considering continues improvement

19-Support by Publisher: Support by publisher

20-New Edition: compatibility with new conditions

21-Easy for Execution: Execution of model easily

Models / Sub Criteria	**OPM3**	**Prince**	**CMMI**	**BPMM**
Publisher	PMI	OGC	SEI	OMG
Scope	PM	PM	Software	Business
Number of	------	1-3	1-5	1-5

Maturity Level				
Discrete and Continues	Continues	Discrete	Discrete	Discrete
Details	Extremely High	High	High	High
Date of Issue	2003	2005	2001	2007
Refer to Standard	PMBOK	Prince		
Considering Culture	Medium	Medium	Medium	Medium
Project Management Process	Yes	Yes	Yes	Yes
Program Management Process	Yes	Yes	Yes	Yes
Portfolio Management Process	Yes	No	No	No
Assessment Difficulty	Low	High	High	High
Assessment Cost	Low	High	Medium	Medium
Identifying weakness and strengths	Yes	Unknown	Yes	Yes
Training Difficulty	Low	High	High	High
Operation	High	Medium	Medium	Medium
Commitment for Continuous Improvement	Yes	Yes	Yes	Yes
Support by Publisher	High	High	High	Medium
New Edition	Yes	Yes	Yes	Yes
Easy for Execution	Yes	Yes	Yes	Yes

Table 1: Comparison of Maturity Models

10. Reason of selection of the OPM3

OPM3 select as best maturity model among four mentioned maturity model according to the below items.

1- Referring to the PMBOK as acceptable standard
2- Considering portfolio management, program management and project management.
3- Having continues approach while most of the other models have five maturity level and are discrete
4- Having 586 best practice and 2400 capability that show more details for this model
5- Date of issue that indicate this model is not old
6- Publisher that is PMI, the most popular institute in the project management
7- Having the assessment tools, this model use special software for analyzing collected data
8- Attention to the improvement
9- Identifying the weakness and strong points by model
10- Supporting by PMI
11- Emphasis to continuous improvement and priority of improvement
12- Using this model is not costly
13- Executing of the model is easy
14- this model is not related to the special industry

11. Conclusion

The aim of this research was comparison of maturity models by considering some general factors. The four maturity model select randomly. The authors also select some factors to comparison of models. These factors are general. This research concluded that OPM3 is the best maturity models among four selected maturity models in terms of these items. We don't say that OPM3 is the best one in the world and in all situations because this need more research.

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