Analysis of Common Maturity Models Applied to Project Management

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Abstract The application of maturity models to the Project Management may help organizations to integrate this methodology into their culture. This article tries to show the main current models, identifying their relevant aspects. Due to the low project management culture in most organizations, a mix of both of them is proposed.

Keywords: Project Management, Maturity Models, Maturity Scales.

1 Introduction

Several organizations are realizing the importance of integrating Project Management into their organizational culture. Project Management itself is constantly evolving as a discipline of knowledge.

This article attempts to analyze the more usual project management maturity models that currently organizations use.

2 Origin of Maturity Models and Its Application to Project Management

The origin of process maturity concept was born into Total Quality frame (Cooke-Davies et al., 2001), where application of process control techniques showed that the increase of maturity had two consequences:

1. Variability reduction inherent in the process.

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2. Increase of the process performance.

Crosby (1979) presents a five increasing levels of maturity for the concept of quality in organizations.

One of the best references about the maturity scale model is PPORF Method (Practical Program Of Revolutions in Factories) and was created by Iwao Kobayashi (1995). This describes 20 “Keys” that are crucial to develop a world class company.

Other example of the model application is the KCG 20 Keys (Lareau, 2002), that considers maturity stages applied to any organizational area.

After the origin, for extension this idea spreads to software organizations through Capability Maturity Models and developed by Software Engineering Institute (SEI) of the Carnegie-Mellon University between 1986 and 1993 (Paulk et al. 1993). This concept of process maturity progresses as the organizational process maturity. The model, called Capability Maturity Model Integration (CMMI®), establishes a scale of five stages to maturity: initial level, repeatable level, defined level, managed and optimized level. These five levels correspond to an ordinal scale to measure process maturity and capability of software organizations.

In the 90, some of these models were developed, such as the Maturity Map created by McCauley (1993), Microframe Technologies' Model, which provide the framework for the capability analysis (Remy, 1997) or those developed by Ibbs and Kwak (1997) or Kerzner (2001).

The Project Management Institute, PMI, created in 2001 a standard for the organizational maturity in the Project Management, named OPM³™ (Schlichter, 2001) and launched in December 2003.

Another example for the maturity model application in Project Management is (PM)², that integrates the previous project management practices and maturity models to increase their effectiveness (Kwak et al., 2002).

The concept of project management maturity gained considerable traction in the early 2000s.

Also the UK’s Office of Government Commerce (OGC) developed two models: firstly, the Portfolio, Programme and Project Management Maturity Model (P3M3©) in 2004 and then the PRINCE2™ Maturity Model (P2MM©) in 2005-2006, that is a derivation from the first one.

3 Main Project Management Maturity Models

There are lots of models available that different organizations use. Herewith, five core existing models are considered:

- Capability Maturity Model Integration (CMMI®)
• PRINCE2™ Maturity Model (P2MM©)
• Portfolio, Programme and Project Management Maturity Model (P3M3©)
• Organizational Project Management Maturity Model (OPM3®)
• IPMA Project Excellence Model

The table 1 shows the main aspects related to this five models.

<table>
<thead>
<tr>
<th>Maturity Model</th>
<th>Sector</th>
<th>Scope</th>
<th>Levels</th>
<th>Self-assessed</th>
<th>Facilitator-led</th>
<th>Accreditation</th>
</tr>
</thead>
<tbody>
<tr>
<td>CMMI® Staged</td>
<td>Software and systems engineering</td>
<td>22 process areas</td>
<td>5 levels</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>CMMI® Continuous</td>
<td>Software and systems engineering</td>
<td>22 process areas</td>
<td>5 levels</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>P2MM©</td>
<td>All</td>
<td>PRINCE2 key aspects</td>
<td>5 levels</td>
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<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>P3M3©</td>
<td>All</td>
<td>32 process aspects</td>
<td>5 levels</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>OPM3®</td>
<td>All</td>
<td>Best practices-4 levels for projects, portfolios and programmes</td>
<td>Yes</td>
<td>Optional</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>OPM3® ProductSuite</td>
<td>All</td>
<td>Best practices-4 levels for projects, portfolios and programmes</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>PEM</td>
<td>Only projects</td>
<td>9 criteria and 100 points 22 subcriteria</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
</tbody>
</table>

### 3.1 Capability Maturity Model Integration (CMMI®)

The Capability Maturity Model Integration (CMMI®), owned by Software Engineering Institute (SEI), is oriented to software and systems engineering. This model probably is the most used, but with the drawback of the implementation framework to this specific sector.

This model focuses on ‘what’ needs to be done, rather than ‘how’ it should be done. It has three versions: for developers, for Acquisition and for services. In this last one, it presents 24 process areas, and each process area has a set of goals and practices associated with them.

In this case, the model presents two different representations: stages and continuous. The first one has five levels of maturity, from 1 to 5, in the process areas.
In the second representation, the model assess against a capability scale from 0 to 5.

### 3.2 PRINCE2™ Maturity Model (P2MM©)

The PRINCE2™ Maturity Model (P2MM©) is owned by the UK’s Office of Government Commerce (OGC) in 2005-2006, as a derivation from its other model, Portfolio, Programme and Project Management Maturity Model (P3M3©).

P2MM© does not itself contain detailed descriptions of the activities needed to support project management processes, then the model needs for its application that the PRINCE2™ would be considered.

This model is a hierarchical one, which describes the key elements of the PRINCE2™ method that need to be embedded within an organization to achieve a certain maturity level.

Each level focuses on a set of key process areas, each process area being unique to a specific level of the model and underpinning achievement of higher levels of maturity.

Probably the main benefit of this model for organizations the strength evaluation within the PRINCE2™.

### 3.3 Portfolio, Programme and Project Management Maturity Model (P3M3©)

The Portfolio, Programme and Project Management Maturity Model (P3M3©) is owned by the Office of Government Commerce (OGC) and was developed in 2004 to build programme and portfolio maturity elements into an existing project management maturity model.

The P3M3© is essentially a set of structured descriptions of some 32 processes that span project, programme and portfolio management e.g. project definition, risk management and quality management.

The process descriptions are allotted within the document structure to five different maturity levels from the lowest ‘Initial Process’ through ‘Repeatable Process’, ‘Defined Process’ and ‘Managed Process’ to the highest ‘Optimised Process’.
3.4 Organizational Project Management Maturity Model (OPM3®)

The Organizational Project Management Maturity Model (OPM3®) is a standard owned by the Project Management Institute (PMI) and was launched in 2003 to help organizations align diverse aspects of their operations with their overall business strategy.

The standard defines globally developed and recognised industry ‘best practices’ that are necessary in each of these three domains, and the incremental ‘capabilities’ that are prerequisites to each ‘best practice’. Both the term ‘best practice’ and the term ‘capability’ are defined within the standard. The degree to which each ‘capability’ is practiced is defined in terms of one of four stages of process improvement: standardised, controlled, measured or improved. Also, the model considers the PMBOK® Guide in the implementation the project management maturity.

One advantage of this model is its scalability, its relationship with PMBOK® and the number of organizations that use it.

3.5 IPMA Project Excellence Model

The Project Excellence Model is owned by the International Project Management Association (IPMA) and was developed in 1996 by the German Project Management Association from the European Foundation for Quality Management (EFQM) Excellence Model.

The Project Excellence Model provides a framework for assessing how well a project team is delivering, or has delivered a project. It has nine criteria related to project excellence. Also, it has two different blocks: project management and project results. Each criteria is divided into several sub-criteria, for a total of 22 sub-criteria. Each of these is described in a way that allows actual activities and results to be assessed.

In order to evaluate the excellence of the project, each sub-criteria is scored from 0 to 100. Each sub-criteria is weighted within its criteria. The assessment is completed by the individual analysis of each criteria and the weighted sum of all.

The great disadvantage of this model is its focus exclusively on individual projects, rather than penetration of project management in the corporate culture.
4 Conclusions to Be Considered in Organizations without Project Management Culture

Most of organizations do not consider the Project Management in their own culture. In a first analysis, with a representative sample of SMEs, none uses any project management methodology.

In order to apply a maturity model to implement project management, the five previous ones are at a much higher level to develop a culture of project management in this business structures.

Taken into account the CMMI®’s maturity scale for the staged representation, the levels are:

1. Initial: Processes are ad hoc, unpredictable and reactive
2. Managed: Basic processes are in place but may be different by project
3. Defined: Processes are in place based on organisational standard models
4. Quantitatively Managed: Processes are measured and controlled
5. Optimising: Process improvement is a continual focus

The analyzed organizations, which have not adopted process improvement programmes, are at level 1 and progress through the levels of maturity by adopting the goals and practices which are defined for the processes at each level.

This model CMMI®, as well as P2MM©, P3M3© and OPM3®, are somewhat complex to establish goals to implement the project management culture. Although, the proposed scale can be used.

There is another model, called Programme Management Maturity Model (PMMM) and developed by two of the APM Programme Management (ProgM) specific interest group officers, Paul Rayner and Geoff Reiss, that can be used as base for the scale application.

This model examines programmes using ten key aspects of programme management and is linked to the Programme Management Improvement Process that provides a guide to improving maturity across these areas. An organization could identify its strengths and weakness in programme management maturity in comparison with other ones.

The ten aspects of programme management covered by PMMM are:

1. Management organisation
2. Planning
3. Management of benefits
4. Management of stakeholders
5. Issue and risk management
6. Quality management and auditing
7. Configuration management
8. Internal communication
9. Programme accounting and finances
10. Scope and change
5 References

Cooke-Davies TJ; Schlichter F. et al. (2001), 'Beyond the PMBOK Guide', *PMI Annual Seminars and Symposium 2001*, Nashville TS.


