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CMMI® and OPM3® as Maturity Appraisal and Improvement Models

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"Leave what makes you doubt to what does not make you doubt; truthfulness is tranquility and lying is suspicion."
Mohammed (PBUH)

Abstract

The purpose of this paper is to survey the SEI's CMMI model and the PMI's OPM3 model as being used in appraising organizations based on maturity. Organizations seeking appraisal of their current maturity, either for internal strategic goals, or for external commercial and trade requirements, will consider basing their maturity assessment and improvement efforts on a global framework which was developed for satisfying these organizational improvement needs. Most well-known models currently are CMMI (with several constellations) from the Software Engineering Institute (SEI) of Carnegie Mellon University, and the Organizational Project Management Maturity Model (OPM3) from the Project Management Institute (PMI), among other models from other providers. In this paper we will explore these two models from maturity assessment and improvement point of view. We will highlight differences, and show the applicability of each model, while opposing components and characteristics of each model to clarify how it is intended to be applied in actual use. We will consider scope of each model, components and artifacts, appraisal settings (resources and appraisal methods), and how improvement planning is done in each. Finally, we will have a look at how the two models can be integrated in application. This paper is intended to be an executive summary and will not introduce either model in details as this is out of scope of the intended discussion. Readers are referred to relevant resources for more information about the respective model.

Keywords: Organizational project management; OPM3; project management maturity; project management assessment; CMMI; CMMI appraisal; organizational maturity

1. Scope

CMMI models have been developed with mainly IT environments in mind. It is focused mostly on IT/Software Operational Maturity in the organization, with some aspects applicable to other industries in some cases. On the other hand, OPM3 is concerned with Organizational Project Management Maturity, so it is very focused on the project management practices in any organization or organizational unit in question. While there are specific process areas and practices in CMMI specific to project management practices within the wider context of the organization, the focus on project management practices in OPM3 is almost exclusive.

CMMI maturity level is demonstrated by a certificate issued for organizations with the achieved level. This usually represents the motive of why organizations go for appraisal, mainly for commercial image and competitive position targets and/or customer requirements. This may lead to less passion and seriousness of the organization under assessment as they may be only caring about getting the certificate more than actual practices on the ground.

In OPM3 applications, no certification is issued. In this case, organizations who attempt assessment and improvement based on OPM3 are guaranteed to have their own passion to go through the assessment and improvement process for tangible result. Organizations are usually more serious, sincere, and honest in this endeavor.

2. Owner

The Capability Maturity Model Integration (CMMI) models are developed and owned by the Software Engineering Institute (SEI) of Carnegie Mellon University.

The Organizational Project Management Maturity Model (OPM3) is developed and owned by the Project Management Institute (PMI), which is a standalone not-for-profit organization dedicated to promoting and improving the project management profession and professionals.

3. History

Initially, there have been several CMM models developed by SEI, each is addressing a specific application area (e.g. development, systems engineering, …etc.). The emergence of the integrated model of several CMMs yielding CMMI models first appeared in 2000, now in v1.3 of all of the three available constellations: Development (CMMI-DEV), Services (CMMI-SVC), and Acquisition (CMMI-ACQ).

The first edition of the OPM3 model was released by PMI in 2003, now in second edition which was released in 2008.

4. Model Artifacts

The following table maps the main components of each of the two models to the corresponding components of the other model. Correspondence here is in terms of role and meaning in the context of the model use. This mapping helps for understanding the composition of the two models, while still preserving the specialties of each specific model scope:

Table 1. Opposition of CMMI and OPM3 Model Artifacts

CMMI	OPM3
3 Constellations: CMMI-DEV, CMMI-SVC, CMMI-ACQ	3 Domains: Project Management, Program Management, Portfolio Management
Process Area Category *	Process Groups *
Process Areas	Processes
Generic Goals (GG)	Organizational Enablers (OE)
Generic Practices (GP)	OE Capabilities
Specific Goals (SG)	Best Practices (BP)
Specific Practices (SP)	BP Capabilities

* This is grouping of processes of similar application phase or purpose. In CMMI, the grouping of process areas is based on their purpose like project management process areas, support process areas, process management process areas, engineering process areas, and service establishment and delivery process areas, among others. In OPM3, grouping of processes is referencing their respective grouping in the 3 domains. In the project management and program management domains, processes are grouped based on their application stage in the lifecycle (initiating, planning, executing, monitoring & controlling, and closing), while in the portfolio management domain there are the aligning process group, and the monitoring and controlling process group. OPM3 also presents other categorizations of Best Practices based on other grouping criteria.

5. Evidence Artifacts in Appraisals/Assessments

In CMMI appraisals, the appraisal team is mainly looking for PIIs (Practice Implementation Indicators) that show how the organization is adopting and implementing the respective applicable CMMI practices. These PIIs are evidenced by interviews and document reviews conducted by the appraisal team with the organization staff participating in the appraisal effort.

In OPM3, Best Practices are composed of Capabilities, which in turn are composed of Outcomes that manifest themselves eventually in the form of KPIs. OPM3 assessments are looking for Outcomes and KPIs that show achievement of the Capability and in turn sum up to Best Practice achievement. These KPIs and Outcomes are also evidenced by interviews and document reviews.

In both cases, the model practices need to be genuinely institutionalized in the organization and adopted by the staff in order for the appraisal / assessment to be successful.

6. Appraisers & Assessors

CMMI appraisals are performed by an appraisal team consisting of a certified Lead Appraiser and a number of

appraisal team members (ATMs) who may be internal of the organization being appraised, or externally contracted for the appraisal purposes. The Lead Appraiser must be certified by SEI and is restricted to be associated with an SEI partner, while the ATMs can come from anywhere, provided that they have received official training on the respective constellation model.

OPM3 assessments differentiate between the high-level self-assessment step, and the comprehensive assessment step. Each of these two steps is optional, meaning that a certain organization may choose to conduct the high-level self-assessment step and not to proceed to the comprehensive assessment step, or may go directly to the comprehensive assessment step. The purpose of the two steps is different in terms of the level of detail of the appraisal results and the consecutive improvement plan. For high-level self-assessment, the assessor can be anyone possessing the necessary knowledge without certification prerequisites, as well as the case for comprehensive assessment performed by the organization under assessment itself using the OPM3 capabilities directory. However, in case of the comprehensive assessment using the ProductSuite assessment software tool, the assessor must be Certified OPM3 Consultant & Assessor by PMI in order to be able to use the software tool that's exclusively licensed to certified professionals. The tool is intended to make the comprehensive assessment more automated and helps improvement by generating assessment reports and improvement path from the tool itself. There are no restrictions related to affiliation of the individual(s) performing assessment, whether they are OPM3 Certified Consultant & Assessor or others.

7. Appraisal/Assessment Methods

The different terms used in both models are indicative for the purpose of each of them. While in CMMI the review for conformance effort is defined by the term "appraisal", the counterpart in OPM3 is the term "assessment". Appraisal is usually used for evaluation directed to rating, which in CMMI attributing the organization's maturity to the predefined levels. Assessment is a more general purpose term for which evaluation aim is defined by the assessor and by the measures based on which assessment is carried out.

There are remarkable differences between how appraisals and assessments are carried out based on the two models. The following table highlights these differences:

Table 2. Comparison of CMMI and OPM3 Assessment Methods

CMMI	OPM3
5 ~~continuous~~ Maturity Levels / 3 ~~discrete~~ Capability levels based on achievement of Process Areas goals and practices.	Percentage maturity score on a maturity continuum based on achievement of Best Practices. §
Levels consist of specific targeted process areas, which entails the constituting applicable SGs and SPs, in addition to GGs and GPs	Score doesn't require achievement of specific Best Practices and their constituting Capabilities, rather, it's a total score of net achievements, and the score interpretation depends on the organization's initial targets from the assessment/improvement effort.
No appraisal and improvement software tool	Self-Assessment Method (SAM) online or using the model standard, and the ProductSuite software tool.
Appraisal against CMMI models is most often done using SCAMPI Appraisal method. *	OPM3 is a model and method on its own. **

§ OPM3 also recognizes maturity levels of individual domains based on the SMCI improvement cycle (Standardize, Measure, Control, Improve). Each process in the 3 domains of project/program/portfolio management spawns 4 separate Best Practices in the OPM3 model that are measured and assessed separately, and reported in the final assessment report, in addition to the total aggregated score on the maturity continuum.

* "Appraisals of organizations using a CMMI model must conform to the requirements defined in the Appraisal Requirements for CMMI (ARC) document" (available from SEI). "These appraisals focus on identifying improvement opportunities and comparing the organization's processes to CMMI best practices... A full benchmarking class of appraisal is defined as a Class A appraisal. Less formal methods are defined as Class B or Class C methods." [3]. Appraisal against CMMI models is most often done using SCAMPI Appraisal method (which is also established by SEI). "The SCAMPI family of appraisals includes Class A, B, and C appraisal methods. The SCAMPI A appraisal method is the officially recognized and most rigorous method. It is the only method that can result in benchmark quality ratings. SCAMPI B and C appraisal methods provide organizations with improvement information that is less formal than the results of a SCAMPI A appraisal, but nonetheless helps the organization to identify improvement opportunities." [2]

** OPM3 is a model and method on its own, the assessment methods and steps to be performed in conducting

assessment are included in the OPM3 standard model itself. It explains the high-level self-assessment method (SAM), as well as the comprehensive assessment method which may follow the initial high-level assessment, and may be performed by the organization itself using the OPM3 directory, or may be performed through a certified OPM3 assessor using the OPM3 ProductSuite tool.

8. Improvement Planning

The improvement plan in CMMI is based on the model levels targeted by the organization. In case of continuous maturity levels, the targeted process areas are already specified by the CMMI model, and improvement planning for the next maturity level simply follows the guidance of the practices specified in the model for the specified process areas. In case of discrete capability levels, the organization focuses on the process areas it needs to improve, and increases its capability level in these planned process areas. Improvement planning in CMMI doesn't depend on initial appraisal, rather, the model can be followed directly, and the appraisal step follows improvement efforts to assure and certify improvement achievements

Improvement planning in OPM3 is based on the model Capabilities Directory. According to the results of the step of assessment, the improvement plan is developed to build upon the current maturity state, in order to move to the next practices contributing to the organization's targeted goals in order to increase maturity grade.

"OPM3 consists of three interlocking elements: knowledge, assessment, and improvement. The knowledge element provides the organization with descriptive information regarding Best Practices, Capabilities, Outcomes, and other organizational project management maturity components. The assessment element enables the organization to determine its current location on a continuum of organizational project management maturity. The improvement element employs the results of the assessment to plan initiatives leading to increased organizational project management maturity." [1]

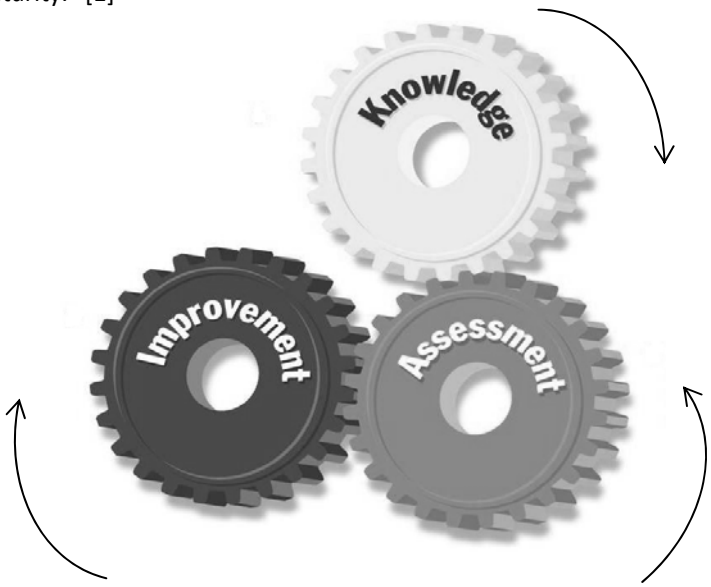

Fig. 1. OPM3 Elements [1]

9. Integration

Are the two models integrateable? Integration can occur within the scope of project management related process areas and goals in any of the CMMI models, and the corresponding Best Practices in the OPM3 model. Applying the entailed best practices in the OPM3 model will lead directly to satisfying the corresponding goals in relevant process areas in the CMMI model. Alternatively, the CMMI process areas belonging to the project management category can be implemented as an initial guidance before attempting an OPM3 assessment to prepare for more rigorous implementation to dive deeper in the specific project/program/portfolio management domain standard processes and practices.

However, the organization will need to define its targets from any of these assessments and improvement plans carefully before proceeding, that's in order not to duplicate the effort or waste resources in a counter productive way. In all cases, senior management support and sponsorship for the assessment and improvement initiative must be secured upfront, in order to reduce resistance and ensure success.

References

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