Deming Certification & Rating Pvt. Ltd.

Email: - info@demingcert.com
Contact: - 02502341257/9322728183
Website: - www.demingcert.com
No. 108, Mehta Chambers, Station Road, Novghar, Behind Tungareswar Sweet,
Vasai West, Thane District, Mumbai- 401202, Maharashtra, India

CMMi

What is CMMi Certificate?

Capability Maturity Model Integration (**CMMI**) is a process level improvement training and appraisal program. Administered by the **CMMI Institute**, a subsidiary of ISACA, it was developed at Carnegie Mellon University (CMU). It is required by many U.S. Government contracts, especially in software development. CMU claims CMMI can be used to guide process improvement across a project, division, or an entire organization. CMMI defines the following maturity levels for processes: Initial, Managed, Defined, Quantitatively Managed, and Optimizing. Version 2.0 was published in 2018 (Version 1.3 was published in 2010, and is the reference model for the remaining information in this wiki article). CMMI is registered in the U.S. Patent and Trademark Office by CMU.

Overview

Characteristics of the maturity levels.

Originally CMMI addresses three areas of interest:

1. Product and service development – CMMI for Development (CMMI-DEV),
2. Service establishment, management, – CMMI for Services (CMMI-SVC), and
3. Product and service acquisition – CMMI for Acquisition (CMMI-ACQ).

In version 2.0 these three areas (that previously had a separate model each) were merged into a single model.

CMMI was developed by a group from industry, government, and the Software Engineering Institute (SEI) at CMU. CMMI models provide guidance for developing or improving processes that meet the business goals of an organization. A CMMI model may also be used as a framework for appraising the process maturity of the organization. By January 2013, the entire CMMI product suite was transferred from the SEI to the CMMI Institute, a newly created organization at Carnegie Mellon.
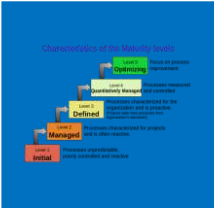
History

CMMI was developed by the CMMI project, which aimed to improve the usability of maturity models by integrating many different models into one framework. The project consisted of members of industry, government and the Carnegie Mellon Software Engineering Institute (SEI). The main sponsors included the Office of the Secretary of Defense (OSD) and the National Defense Industrial Association.

CMMI is the successor of the capability maturity model (CMM) or Software CMM. The CMM was developed from 1987 until 1997. In 2002, version 1.1 was released, version 1.2 followed in August 2006, and version 1.3 in November 2010. Some major changes in CMMI V1.3 are the support of agile software development, improvements to high maturity practices and alignment of the representation (staged and continuous).

According to the Software Engineering Institute (SEI, 2008), CMMI helps "integrate traditionally separate organizational functions, set process improvement goals and priorities, provide guidance for quality processes, and provide a point of reference for appraising current processes."

Mary Beth Chrissis, Mike Konrad, and Sandy Shrum Rawdon were the authorship team for the hard copy publication of CMMI for Development Version 1.2 and 1.3. The Addison-Wesley publication of Version 1.3 was dedicated to the memory of Watts Humphry. Eileen C. Forrester, Brandon L. Buteau, and Sandy Shrum were the authorship team for the hard copy publication of CMMI for Services Version 1.3. Rawdon "Rusty" Young was the chief architect for the development of CMMI version 2.0. He was previously the CMMI Product Owner and the SCAMPI Quality Lead for the Software Engineering Institute.

In March 2016, the CMMI Institute was acquired by ISACA.

CMMI topics

Representation

In version 1.3 CMMI existed in two representations: continuous and staged. The continuous representation is designed to allow the user to focus on the specific processes that are considered important for the organization's immediate business objectives, or those to which the organization assigns a high degree of risks. The staged representation is designed to provide a standard sequence of improvements, and can serve as a basis for comparing the maturity of different projects and organizations. The staged representation also provides for an easy migration from the SW-CMM to CMMI.

In version 2.0 the above representation separation was cancelled and there is now only one cohesive model.

Model framework (v1.3)
Further information: Process area (CMMI)

Depending on the areas of interest (acquisition, services, development) used, the process areas it contains will vary. Process areas are the areas that will be covered by the organization's processes. The table below lists the seventeen CMMI core process areas that are present for all CMMI areas of interest in version

Models (v1.3)

CMMI best practices are published in documents called models, each of which addresses a different area of interest. Version 1.3 provides models for three areas of interest: development, acquisition, and services.

- CMMI for Development (CMMI-DEV), v1.3 was released in November 2010. It addresses product and service development processes.
- CMMI for Acquisition (CMMI-ACQ), v1.3 was released in November 2010. It addresses supply chain management, acquisition, and outsourcing processes in government and industry.
- CMMI for Services (CMMI-SVC), v1.3 was released in November 2010. It addresses guidance for delivering services within an organization and to external customers.
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Model (v2.0)

In version 2.0 DEV, ACQ and SVC were merged into a single model where each process area potentially has a specific reference to one or more of these three aspects. Trying to keep up with the industry the model also has explicit reference to agile aspects in some process areas.

Some key differences between v1.3 and v2.0 models are given below:

1. "Process Areas" have been replaced with "Practice Areas (PA's)". The latter is arranged by levels, not "Specific Goals".
2. Each PA is composed of a "core" [i.e. a generic and terminology-free description] and "context-specific" [i.e. description from the perspective of Agile/ Scrum, development, services, etc.] section.
3. Since all practices are now compulsory to comply, "Expected" section has been removed.
4. "Generic Practices" have been put under a new area called "Governance and Implementation Infrastructure", while "Specific practices" have been omitted.
5. Emphasis on ensuring implementation of PA's and that these are practised continuously until they become a "habit".
6. All maturity levels focus on the keyword "performance".
7. Two and five optional PA's from "Safety" and "Security" purview have been included.
8. PCMM process areas have been merged.

Applications

The SEI published a study saying 60 organizations measured increases of performance in the categories of cost, schedule, productivity, quality and customer satisfaction. The median increase in performance varied between 14% (customer satisfaction) and 62% (productivity). However, the CMMI model mostly deals with *what* processes should be implemented, and not so much with *how* they can be implemented. These results do not guarantee that applying CMMI will increase performance in every organization. A small company with few resources may be less likely to benefit from CMMI; this view is supported by the process maturity profile (page 10). Of the small

organizations (<25 employees), 70.5% are assessed at level 2: Managed, while 52.8% of the organizations with 1,001–2,000 employees are rated at the highest level (5: Optimizing).