



CMMI[®] A-Specification

Version 1.7
For CMMI Version 1.2

November, 2007

This document is controlled by the CMMI Steering Group.

CHANGE PAGE HISTORY

This is the first release of the A-Spec for CMMI v1.2.
Change page history for the A-Spec for CMMI through v1.1 is contained in CMMI A-Spec version 1.6h.

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List of Terms and Acronyms as used in CMMI

ACQ	Acquisition (<i>as in CMMI-ACQ</i>)
AM	Acquisition Module (<i>as in CMMI-AM</i>)
ARC	Appraisal Requirements for CMMI
Area of Interest	Defines the intended application of the CMMI Models
C4I	Command, Control, Communications, Computers, and Intelligence
CBA IPI	CMM-Based Appraisal for Internal Process Improvement (<i>used with SW-CMM</i>)
CCB	Configuration Control Board
CM	Capability Model
CMM	Capability Maturity Model
CMMI	Capability Maturity Model Integration
CMMI Model Foundation (CMF)	The skeleton model that contains the core model components in every CMMI model
CMU	Carnegie Mellon University
CONOPs	Concept of Operations
Constellation	Groupings of components to support a specific model application for an Area of Interest
CR	Change Request
DEV	Development (<i>as in CMMI-DEV</i>)
Discipline	Body of knowledge and practice in an engineering functional area
DoD	Department of Defense
IEC	International Electrotechnical Commission

IPPD	Integrated Product and Process Development
ISO	International Standards Organization
MDD	Method Definition Document
OSD	Office of the Secretary of Defense
PA	Process Area
SE	Systems Engineering
SEI	Software Engineering Institute
SCAMPI	Standard CMMI Appraisal Method for Process Improvement
SVC	Services
SW	Software
SG	Steering Group
TEMP	Test and Evaluation Master Plan

The following specification is for the CMMI® Product Suite. The specification defines the scope, lists applicable documents, defines the requirements the CMMI Product Suite must meet to be considered acceptable, identifies the methods for verifying achievement of the requirements, provides packaging information and general notes.

1. Scope

1.1 Identification. This specification defines the requirements for a Capability Maturity Model Integration (CMMI®) Product Suite version 1.2.

1.2 Description. The CMMI Product Suite provides industry and government a set of integrated products to support process and product improvement. By reducing redundancy and complexity with the separate use of multiple Capability Maturity Models (CMMs®) and related Capability Models (CMs) the CMMI-Models (herein referred to as “models”), and the other CMMI products should improve efficiency of and the return on investment for process improvement. The resulting CMMI products will be tailorable to an organization’s mission/business objectives.

1.3 Overview. There are several existing, widely known models. Some of the individual discipline models, when used in combination offer redundant and inconsistent guidance. The content and characteristics of these models provide a basis for the CMMI Product Suite. Integrating the development characteristics and delivery methods of these and future models will enable users to reduce the cost of performing appraisals and implementing improvements. The initial CMMI Product Suite includes a framework for generating CMMI products to meet business objectives/mission needs, and a set of CMMI products produced by the framework. The framework includes common elements and best features of the current models as well as rules and methods for generating CMMI products. Discipline specific elements of the CMMI Product Suite will provide the user with the ability to select elements applicable to specific situations. The CMMI Architecture shall be documented for use by model developers. The CMMI Product Suite will consist of:

- Framework
- Architecture
- Capability Maturity Model-Integration Models
- Training Products
- Appraisal Products
- Glossary

2. Applicable References

2.1 Applicable Documents

2.1.1 DoD Directive 5000.1, “Defense Acquisition.”

2.2.2 DoD Instruction 5000.2, “Operation of the Defense Acquisition System

2.2 Source Documents

2.2.1 CMMI-SE/SW+SS+IPPD version 1.1

2.3 Reference Documents

2.3.1 Architecture of the CMMI Framework for CMMI v1.2 and Beyond

2.3.2 Criteria for Product Suite Changes for v1.2 Release Rev E, April 2004

2.4 Definitions

2.4.1 In this document “Area of Interest” is the intended application of the CMMI Model

2.4.2 In this document “discipline” is a body of knowledge and practice, such as Systems Engineering (SE) or Software Engineering (SW), applied in the development of systems, products, or services.

2.4.3 In this document, “functional processes” refers to groups of like activities such as Configuration Management.

2.4.4 In this document “domain” denotes the application area of the system under development, such as: C4I, aeronautical systems, avionics, armament, space and missile systems, and banking as examples.

2.4.5 In this document “CMMI framework” includes common elements and best features of the current models as well as rules and methods for generating models, appraisal methods (including associated artifacts) and training material.

2.4.6 In this document “Integrated Product and Process Development (IPPD)” denotes a management technique that simultaneously integrates all essential acquisition activities through the use of

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multidisciplinary teams to optimize the design, manufacturing and supportability processes. IPPD facilitates meeting cost and performance objectives from product concept through production, including field support.

- 2.4.7 In this document “common processes,” such as those involving Configuration Management, are those processes that would be used across all Areas of Interest.
- 2.4.8 In this document the term “staged representation” denotes a model structure that includes organizational maturity levels based on groupings of process areas.
- 2.4.9 In this document the term “continuous representation with equivalent staging” denotes a model structure of processes that provide a continuum of increasing capability for each process area along with a recommended grouping of process areas.
- 2.4.10 Applicable documents are those DoD policy documents that the CMMI Product Suite must be consistent with and support.
- 2.4.11 Source documents are the starting point for the CMMI Product Suite development. This information can be modified and extended to meet the CMMI requirements.
- 2.4.12 Reference documents describe relevant background and related materials that may be used, as appropriate and helpful, in developing the CMMI Product Suite.
- 2.4.13 Tailoring is used in this specification to address the selective use of the content of the products generated by the CMMI framework. This selective tailoring is done by the using organization in model product application. The CMMI framework is not tailorable.
- 2.4.14 Common elements as used in this specification refer to those components that are common across the entire CMMI Product Suite.
- 2.4.15 The CMMI Product Suite includes a framework and architecture with defined constellations for generating CMMI models to meet business objectives and mission needs, and a set of CMMI models produced by the framework.
- 2.4.16 A Capability Model (CM) for a given Area of Interest is one that describes the process elements for that Area of Interest prior to or outside the framework of the CMMI project. Associated with the

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model is one or more process assessment method(s) that help determine the current process capabilities and identify the most crucial issues to improve product and process effectiveness.

2.4.17 A Capability Maturity Model is one that describes the process elements for that Area of Interest as a result of the CMMI project. The Models shall be known as Constellations. Associated with the CMMI Models is an appraisal methodology that characterizes the current process capabilities and identifies areas for process improvement.

2.4.18 The CMMI Model Foundation (CMF) contains a section on front matter, a section on generic goals and generic practices, a section for each of the required core process areas, and a core glossary. It is designed to provide an internally consistent set of core components that apply to any constellation or model. The Process Areas defined by the Architecture as core process areas must be contained in each Constellation.

2.4.19 Appraisal, as used in this specification, means an assessment for internal process improvement for the purpose of determining maturity or capability.

2.4.20 Method, as used in this specification, means a specific instance of a methodology's procedures and techniques characteristic of a particular discipline or field of knowledge.

2.4.21 Methodology, as used in this specification, means the system of principles, practices, and procedures applied to a specific branch of knowledge, e.g., appraisals.

2.4.22 Consistency, as used in this specification, denotes a uniformity, standardization, and lack of contradiction among the documents and products.

2.4.23 User Beta Test, as used in this specification, includes CMMI pilot tests and subsequent instrumented user evaluations.

2.4.24 In this document “Acquisition” is the Area of Interest utilized by an organization or project to acquire products or services from suppliers outside of the organization or project.

2.4.25 Core Process Areas (PAs) are those PAs that form the core of an integrated capability maturity model and apply to all disciplines .

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2.4.26 In this document “Constellation” refers to groupings of components that are used to construct models in an area of interest, e.g., Acquisition, Development, and Services

3. Functional Requirements

3.1 User Requirements

3.1.1 The CMMI Product Suite shall provide an integrated process improvement tool for the user community.

3.1.2 The CMMI Product Suite shall include integrated models for the area of interest, plus additions as appropriate, e.g. “+IPPD”, and shall include the products listed in Paragraph 8.0.

3.1.3 The CMMI Product Suite shall include a glossary that contains definitions for all unique terms.

3.1.4 The CMMI Product Suite shall provide an internally consistent set of common components that apply to any area of interest and must be included in any CMMI product. These products shall be designed to support process improvement activities, including appraisals, which are less costly than performing these activities using independent models.

3.1.5 CMMI products shall be supportable throughout their life cycle, consistent with continuous process improvement principles.

3.1.6 The CMMI Products shall be derived from CMMI-SE/SW+IPPD+SS v1.1 per the following criteria for each incorporated change:

3.1.6.1 Correction of an identified model(s), training or appraisal method defect

3.1.6.2 Amplifications and clarifications will be incorporated as needed

3.1.6.3 Optional additions to model coverage (i.e. safety, security, life cycle) will be accommodated only by specific direction of the Steering Group

3.1.6.4 It is desirable that overall Model size decreases in v1.2; increases, if any, to accommodate SG-directed changes shall not be greater than absolutely necessary

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3.1.6.5 Model/method changes will not impact the legacy investment of adopting companies & organizations.

3.1.6.6 Architecture, model content and appraisal method changes will not be incorporated without specific CMMI Steering Group authorization

3.1.6.7 Changes may be CR or CMMI Steering Group initiated

3.1.6.8 Generic Changes to Training may be released in advance of v1.2

3.1.6.9 Changes shall not be of sufficient impact to cause retraining of the over-75,000 (as of Sept 2007) personnel already CMMI Trained

3.1.6.10 Changes shall not be of such a nature to cause reappraisal of already appraised organizations to become necessary to retain their achieved specific Level.

3.1.6.11 The underlying CMMI Architecture will change from the present rule-driven construct to a “constellation-based” construct per document entitled “CMMI Framework Architecture Description v1.2 and beyond (v1.2+)” (file name: CMMI Architecture v1.2+)

3.2 Product Suite

3.2.1 The CMMI Product Suite will consist of a framework, architecture and a set of consistent products generated by using the framework and architecture.

3.2.2 The products generated from the CMMI framework shall permit tailoring to meet an individual organization’s goals.

3.2.3 Tailoring guidance shall be provided as part of the CMMI Product Suite.

3.2.4 The CMMI Product Suite shall be composed of the following:

- Framework
- Architecture
- Capability Maturity Model Integration models listed in Paragraph 8.0
- Training Products
 - Capability Model Training
 - Appraisal Training
- Appraisal Products

- Comprehensive appraisal method including data collection methods, tools, and appraisal team qualifications (SCAMPI Method Definition Document)
- NOTE: Guidance on partial appraisal methods (including quick-look appraisal, first appraisal, or reappraisal of the organization) is not part of the CMMI Product Suite but may be obtained from the Steward
- Glossary
- Tailoring guidance
- Application guidance
- Guidebook For Use of CMMI in Acquisition

3.3 Framework and Architecture

- 3.3.1 The CMMI Framework and Architecture will contain a definition and criteria for an integrated Model product, and the CMMI products shall be consistent with that definition and criteria.
- 3.3.2 The CMMI Framework and Architecture shall produce the maximum reasonable commonality of process areas across various Areas of Interest.
- 3.3.3 The CMMI framework and Architecture shall produce a single model construct for each of the allowable combinations as defined in Section 8.0 that shall facilitate appraisal via either “staged” or “continuous” methodology.
- 3.3.4 The CMMI framework and architecture shall be designed to accommodate improvements and additional content in the CMMI Product Suite.

3.4 Models

- 3.4.1 Models variations where allowed shall be constructed by inserting selected groups of additions and selected groups of amplifications into the CMMI model foundation. Generic practice elaborations for the process areas in the model may also be added.
- 3.4.2 All models generated from the framework within a representation shall incorporate all common components.
- 3.4.3 The composition (content) of the models shall be based on practices that are observed, documented, and judged to be effective.
- 3.4.4 The CMMI models listed in par 8.0 and associated appraisal and training materials shall be generated.

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3.4.5 All CMMI-Models, known as Constellations beginning with CMMI v1.2, that are generated from the framework shall have designations consistent with the following:

“CMMI-“ followed by the designators of the area of interest as defined in Section 8.0

3.4.6 There shall also be a CMMI-based Acquisition Module, initially in stand-alone format, oriented for use by a government (DoD or other federal agency) project office in their acquisition of prime contractors required to successfully execute their program. The Acquisition Module will be a synopsis of those CMMI-related activities that the program office should perform for a successful program. The Acquisition Module is not initially intended for formal appraisal, and is intended for self-administration. It shall include a set of specific questions to assist the user in understanding the critical elements of the program. The Module shall be written in such a manner as to allow for subsequent incorporation into the formal CMMI model framework.

3.5 Appraisal requirements

There will be an Appraisal Requirements for CMMI (ARC) document that will address definition and application of appraisal products.

3.6 Appraisals

3.6.1 The appraisal products to be provided shall be common across models including a comprehensive appraisal method and guidance on partial appraisal methods including quick-look appraisal, first appraisal, or reappraisal of the organization.

3.6.2 The comprehensive appraisal method shall define criteria for evaluating process maturity relative to the models.

3.6.3 The comprehensive appraisal method shall support repeatable and consistent appraisal results.

3.6.4 The comprehensive appraisal method shall provide specific guidance for tailoring.

3.6.5 The appraisal outputs shall identify strengths, weaknesses, and potential areas of improvement, relative to documented criteria.

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- 3.6.6 Appraisal findings and maturity level ratings shall be consistent between staged and continuous with equivalent staging representations of the models.
- 3.6.7 Appraisal data collection methods including tools shall be defined to support the appraisal method.
- 3.6.8 The comprehensive appraisal method shall include appraisal team qualifications.

3.7 Training Materials

- 3.7.1 Learning objectives that support efficient use of the CMMI Product Suite shall be defined as part of developing the CMMI product training materials.
- 3.7.2 Model tailoring guidance shall be provided as part of the CMMI training materials.

4. Quality Assurance Provisions

The quality assurance function was performed on CMMI v1.0, 1.02 and v1.1 in accordance with the provisions of CMMI A-Spec v1.6h prior to release. CMMI v1.2 is a minor update to the CMMI Product Suite.

5. Packaging

- 5.1 The CMMI products shall be produced in hard copy and electronic format (soft copy). Soft copy shall be available in editable format (i.e. MicroSoft WORD) as well as Acrobat Portable Document Format (PDF)
- 5.2 The CMMI products except for Training Materials shall be posted to the public portion of the SEI Website after CMMI Steering Group approval.

6. Notes

This section contains only information of general or explanatory nature.

- 6.1 The CMMI Steering Group will perform the CCB function for this A-Specification and the associated Concept of Operations, and the Appraisal Method Definition Document
- 6.2 The CMMI framework should enable disciplined development and evolution of support products.

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- 6.3** The product development team should collaboratively develop the CMMI framework process management common elements using Expert Teams
- 6.4** CMMI product development teams consisting of experienced experts in the areas of interest and experts in building CMMI products should develop the specific components of the CMMI framework.
- 6.5** The objective is to allow replacement of CMMI v1.1 with CMMI v1.2 without the need for reappraisal
- 6.6** CMMI Product Suite Transition and Maintenance Plan will be maintained.
- 6.7** There will be an expiration date for Appraisals of three years after Conduct of Appraisal.

7. Summary of Requirements Verification Methods

The verification process was employed on CMMI v1.0, v1.02 and v1.1 prior to release. CMMI v1.2 is a minor update to the CMMI Product Suite.

8. Constellations (Areas of Interest) and Allowable Models & Combinations for v1.2

Disciplines Covered within the Model Content – Not All Separately Designated

Software Engineering
Systems Engineering
Hardware & Design Engineering
Product and Service design & development
Integrated Product and Process Development (IPPD)
Acquisition
Services Delivered

Allowable Constellations (Models & Combinations) For Maturity Levels & Benchmarking

Development (CMMI-DEV)
Development with IPPD (CMMI-DEV+IPPD)
Acquisition (CMMI-ACQ)
Services Provided (CMMI-SVC)

CMMI-based Acquisition Module (CMMI-AM)

Note 1: all of the above combinations except the Acquisition Module will include all of the Core Process Areas.