



# CMMI<sup>®</sup> Version 1.2

## Model Changes

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# Purpose

The purpose of this module is to describe the major changes to the CMMI models for v1.2.



# Topics

Overview of Model Changes

Detailed Changes

Glossary Changes

Process Area Changes



# Model Changes

The model was changed mainly due to the following:

- Reduce complexity and size
- Expand model coverage



# Reduce Complexity and Size

To reduce model complexity and size, the following changes were made:

- eliminated advanced practices and common features
- eliminated the Supplier Sourcing (SS) addition
- incorporated Integrated Supplier Management (ISM) into Supplier Agreement Management (SAM)
- consolidated and simplified the IPPD material
- added, modified, and consolidated definitions in the glossary (e.g., bidirectional traceability, subprocess)
- adopted a single book approach (i.e., both representations are published in one document)



# Expand Model Coverage

To expand model coverage, the following changes were made:

- added hardware amplifications
- added two work environment specific practices —one in Organizational Process Definition (OPD) and one in Integrated Project Management (IPM)
- updated notes and examples to address service development and acquisition
- updated the model name to CMMI for Development (CMMI-DEV) to reflect the new CMMI architecture



# Other Significant Model Changes

Other significant model changes made include

- improved the clarity of the Overview section (Part One)
- added information about and clarified how generic practices (GPs) are used
- moved the generic goals and practices to Part Two
- explained how process areas support the implementation of the GPs
- added GP elaborations for GP 3.2
- restricted the process areas that can be considered “not applicable” to SAM
- added emphasis on project startup in OPF and IPM



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# Advanced Practices Eliminated

There were two types of advanced practices in v1.1:

- those paired with a base practice
- those that stood alone

To eliminate advanced practices, the following strategies were used:

- Where a base and advance practice covered the same topic, the practices were combined.
- Where there was only an advanced practice, the advanced practice was retained as a specific practice.
- Specific practice numbering was simplified to exclude the capability level.



# Base and Advanced Practices Combined

The following base and advanced practices were combined to form specific practices in v1.2.

## Requirements Development

- SP 1.1: Elicit Needs (combined with “Collect Stakeholder Needs”)
- SP 3.5: Validate Requirements (combined with “Validate Requirements with Comprehensive Methods”)

## Technical Solution

- SP 1.1: Develop Alternative Solutions and Selection Criteria (combined with “Develop Detailed Alternative Solutions and Selection Criteria”)
- SP 2.3: Design Interfaces Using Criteria (combined with “Establish Interface Descriptions”)



# Advanced Practices Converted<sup>1</sup>

The following advanced practices were retained as specific practices in v1.2.

## Requirements Management

- SP 1.2: Obtain Commitment to Requirements
- SP 1.4: Maintain Bidirectional Traceability of Requirements

## Requirements Development

- SP 3.4: Analyze Requirements to Achieve Balance

## Technical Solution

- SP 1.2: Select Product Component Solutions
- SP 2.2: Establish a Technical Data Package
- SP 2.4: Perform Make, Buy, or Reuse Analyses



# Advanced Practices Converted<sup>2</sup>

## Product Integration

- SP 1.2: Establish the Product Integration Environment
- SP 1.3: Establish Product Integration Procedures and Criteria

## Verification

- SP 1.2: Establish the Verification Environment
- SP 1.3: Establish Verification Procedures and Criteria
- SP 2.3: Analyze Peer Review Data
- SP 3.2: Analyze Verification Results

## Validation

- SP 1.2: Establish the Validation Environment
- SP 1.3: Establish Validation Procedures and Criteria



# No More Common Features

Discussion of common features was removed from Part 1.

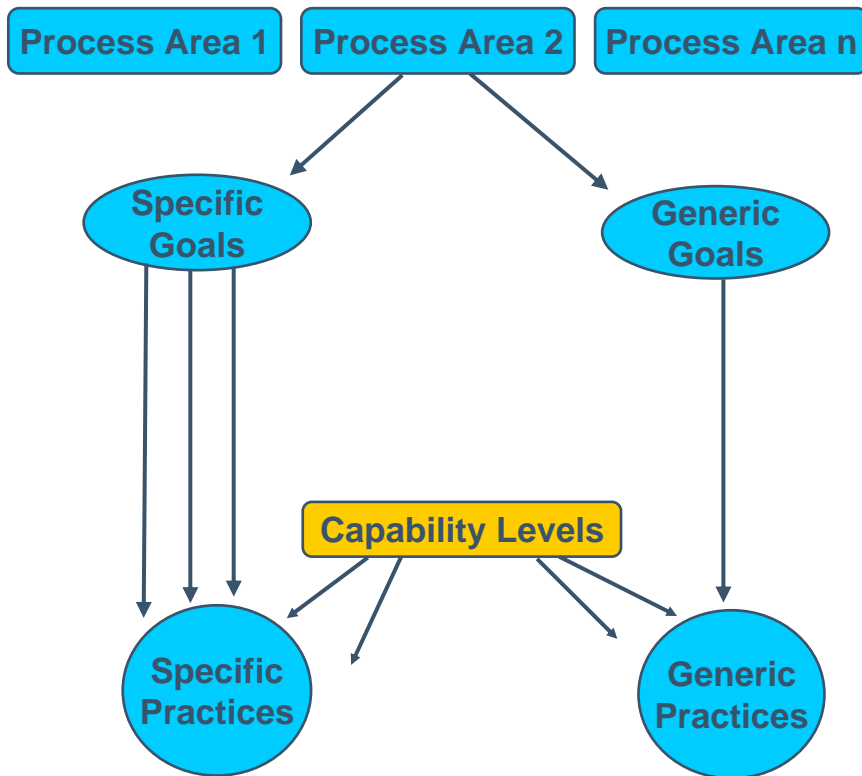
GPs are no longer organized by common features.

The common feature headings were removed.

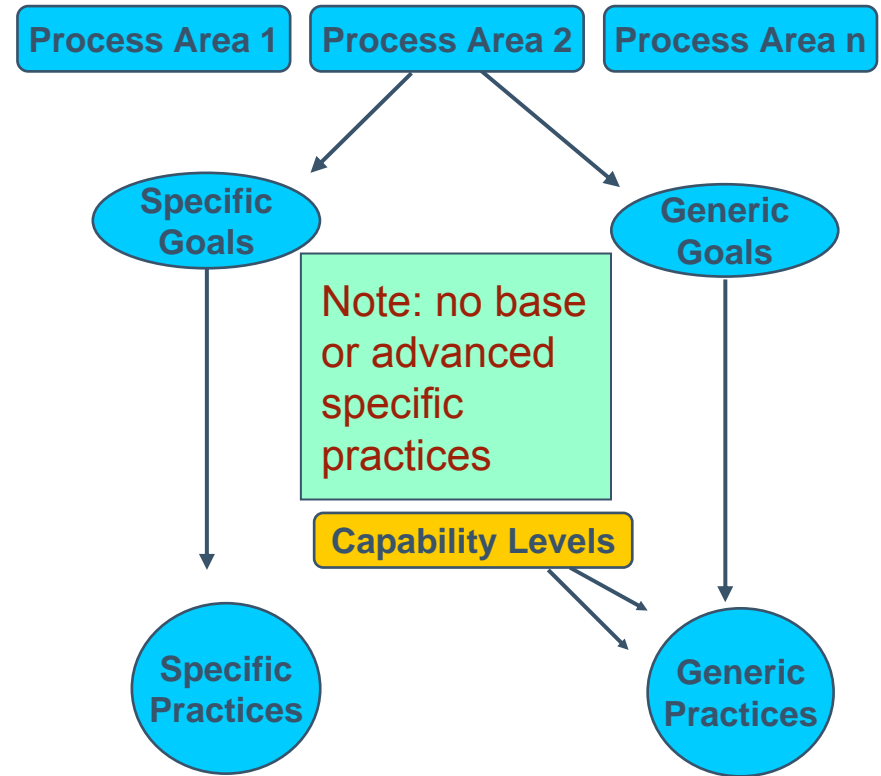
The generic practices in v1.2 are presented by generic goal and are sequentially numbered.

# Model Structure<sup>1</sup>

## Continuous V1.1



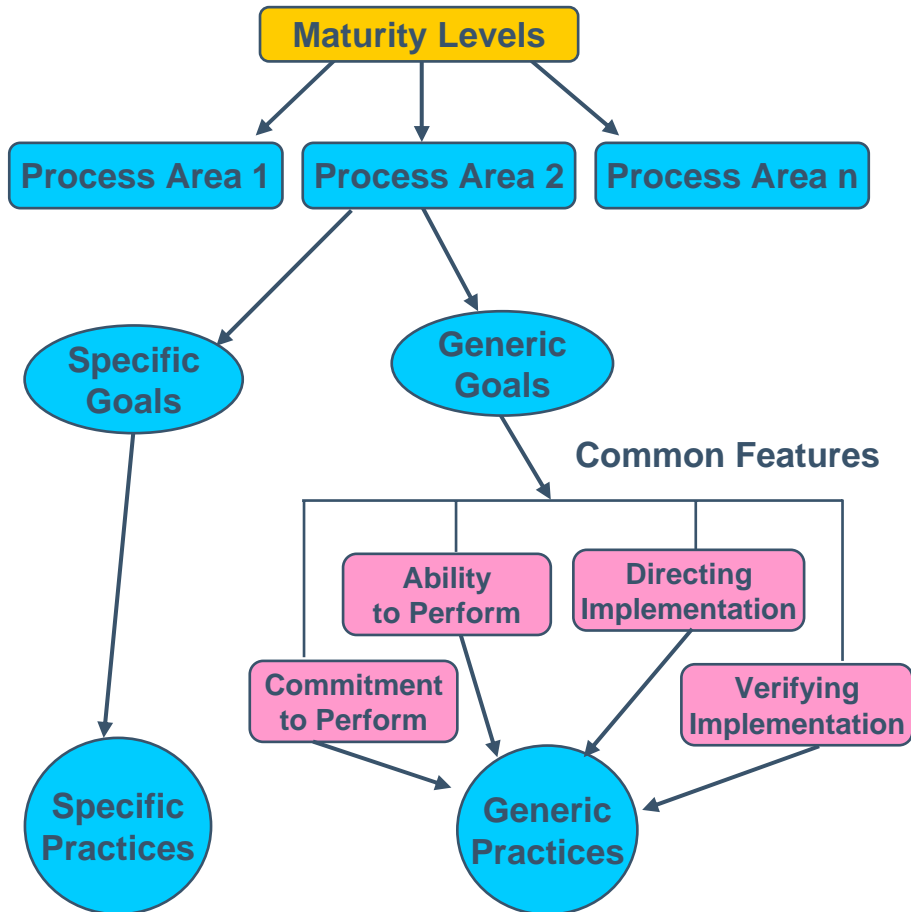
## Continuous V1.2



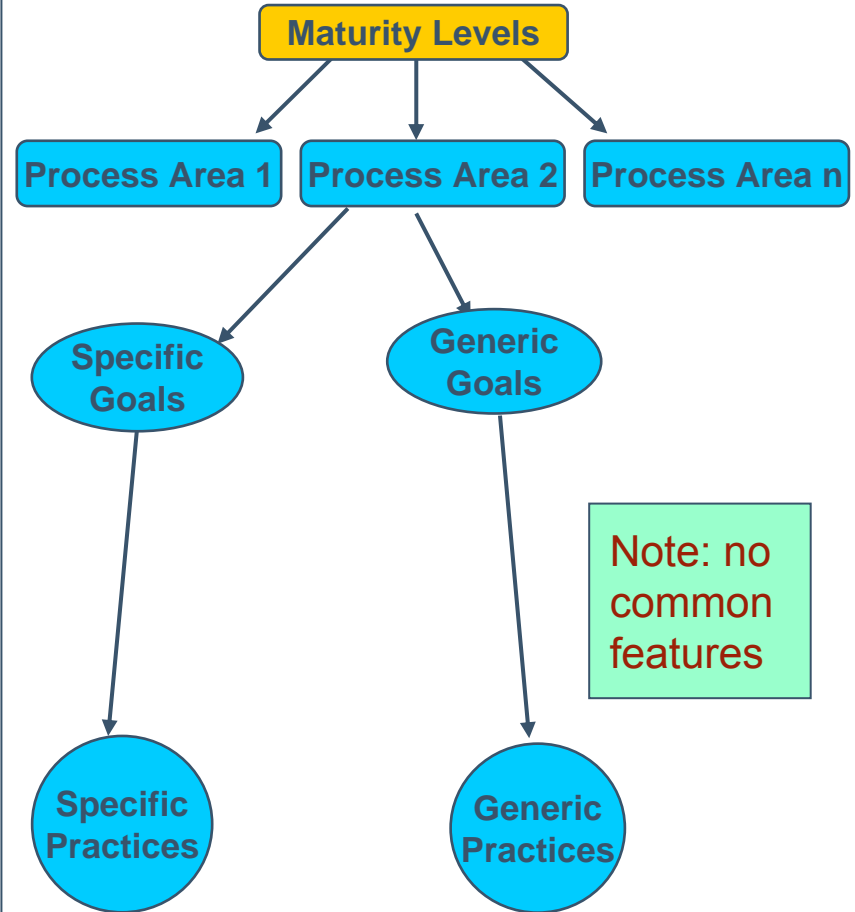


# Model Structure<sup>2</sup>

## Staged V1.1



## Staged V1.2





# No More Supplier Sourcing Addition

Supplier Sourcing was eliminated as an addition.

ISM has been eliminated.

SAM has been enhanced to contain the unique material from ISM.

Two specific practices were added to Goal 2 in SAM:

- SP 2.2 - Monitor Selected Supplier Processes
- SP 2.3 - Evaluate Selected Supplier Work Products



# Simplified IPPD Material

There are no longer whole process areas that address IPPD:

- removed OEI and moved material to OPD
- removed IT and moved material to IPM

Information that addressed “Enable IPPD Management” was moved to OPD.

Information that addressed “Apply IPPD Principles” was moved to IPM.

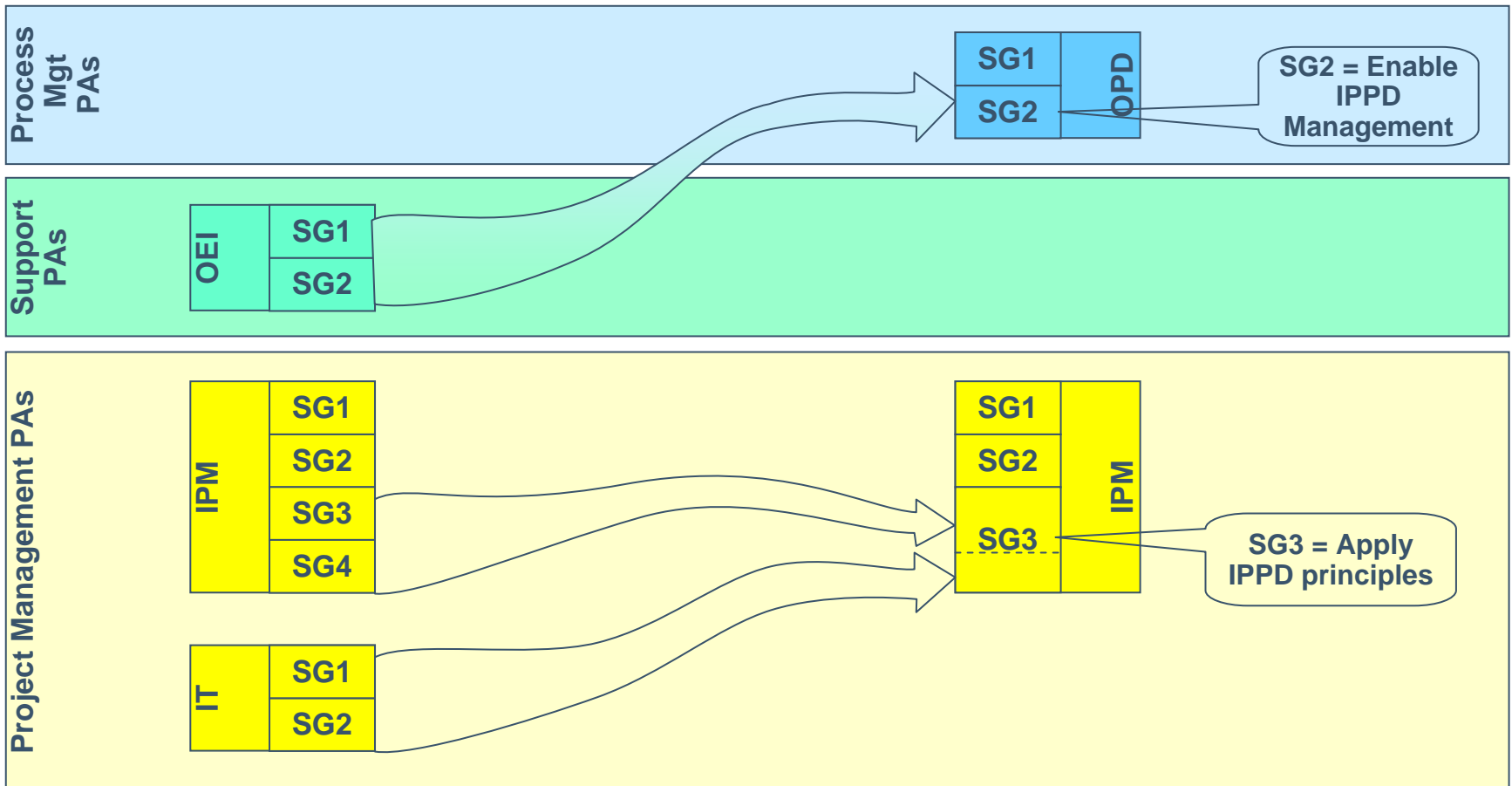
All IPPD material was condensed and revised to be more consistent with the other model material.



# IPPD Changes Illustrated

V1.1

V1.2





# The Model Is a Single Document

All representations, additions, and disciplines are in one document.

Users can choose to use:

- representation-specific content (i.e., continuous, staged)
- addition-specific content (i.e., IPPD)
- amplifications (i.e., hardware engineering, software engineering, systems engineering)



# Added Hardware Amplifications and Examples

Six hardware amplifications were created to add emphasis on hardware engineering. Here is an example from TS.

## SP 2.1 Design the Product or Product Component

Develop a design for the product or product component.

### *For Hardware Engineering*

*Detailed design is focused on product development of electronic, mechanical, electro-optical, and other hardware products and their components. Electrical schematics and interconnection diagrams are developed, mechanical and optical assembly models are generated, and fabrication and assembly processes are developed.*

Hardware examples were also added to emphasize hardware engineering.



# Added Work Environment Coverage

Work environment standards are established at the organizational level in OPD.

**SP 1.6 Establish Work Environment Standards**  
Establish and maintain work environment standards.

The project's work environment is established at the project level in IPM.

**SP 1.3 Establish the Project's Work Environment**  
Establish and maintain the project's work environment based on the organization's work environment standards.



# Other Specific Practice Changes

## OID, SP 1.4

Select process and technology improvements [not “improvement proposals”] for deployment across the organization.

## OPP, SP 1.1

Select the processes or subprocesses [not “process elements”] in the organization’s set of standard processes that are to be included in the organization’s process-performance analysis.



# Overview Section Improvements

The following improvements were made to the model overview (i.e., Part One):

- The chapter containing the generic goals and practices was moved to Part Two with the process areas.
- All definitions are consolidated into the glossary.
- Chapters were reordered into a more logical sequence.
- The **Preface** and **Using CMMI Models** chapter were rewritten and updated.
- Descriptions were updated to reflect the new CMMI architecture:
  - Added descriptions of **constellations** and **additions**
  - Removed descriptions of base and advanced practices and common features



# Improved Generic Practices<sup>1</sup>

Editorial changes were made to the generic practices. These slides highlight the changes that affect the content.

## GP 1.1: Perform Specific Practices

The practice title and statement changed from “perform **base** practices” to “perform **specific** practices.”

## GP 2.2: Plan the Process

The informative material was **condensed** to be consistent with the other generic practices.

## GP 2.4: Assign Responsibility

In the informative material “and **authority**” was added.



# Improved Generic Practices<sup>2</sup>

## GP 2.6: Manage Configurations

In the GP statement, “levels of configuration management” was changed to “**levels of control.**”

## GP 2.9 Objectively Evaluate Adherence

Added informative material to emphasize **work products** also.

## GP 5.2: Correct Root Causes of Problems

Added notes that the focus of this GP is on a **quantitatively managed process**, though root causes may be found outside of that process.



# Explained Generic Practices Better

Moved generic goals and practices to **Part Two** with the process areas so that all normative elements of the model are consolidated in one place

Added information about how process areas support the implementation of generic practices (GPs)

Added GP elaborations for GP 3.2



# “Not Applicable” Process Areas

The set of PAs evaluated to achieve a maturity level is an important variable when conducting an appraisal. In v1.1 it was not clear which PAs could be considered “not applicable.”

In v1.2, the guidance for appraisals exists in both SCAMPI<sup>SM</sup> MDD Appendix A and SCAMPI A Appraisal Disclosure Statement (ADS):

- Only SAM can be declared not applicable.
- Decisions on PAs included in the appraisal must be made by the lead appraiser in conjunction with the appraisal sponsor.
- Rationale for declaring SAM to be “not applicable” must be provided in the Appraisal Disclosure Statement.



# Topics

Overview of Model Changes

Detailed Changes

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# Glossary Changes

The following slides contain significant changes to glossary definitions. Definitions that only had editorial changes are not included.

**New definitions:** addition, amplification, bidirectional traceability, customer requirement, data, functional configuration audit, hardware engineering, higher level management, physical configuration audit, project startup, and service.

**Revised definitions:** acquisition, appraisal, appraisal findings, appraisal scope, audit, capability evaluation, configuration audit, customer, data management, establish and maintain, generic goal, objective evidence, process element, product, product component, project, quality- and process-performance objectives, requirements traceability, shared vision, subprocess, traceability, and work product.



# Definitions Deleted From the Glossary

**Deleted definitions:** ability to perform, advanced practices, agreement/contract requirements, appraisal tailoring, appraisal team leader, base practices, CMMI model tailoring, commitment to perform, directing implementation, discipline amplification, lead appraiser, process context, solicitation package, strength, verifying implementation, weakness

Many of these definitions were deleted because the term wasn't used in the model or the overall concept was removed.



# New Definitions<sup>1</sup>

## addition

In the CMMI Product Suite, a clearly marked model component that contains information of interest to particular users. In a CMMI model, all additions bearing the same name (e.g., the IPPD addition) may be optionally selected as a group for use.

## amplification

Amplifications are informative model components that contain information relevant to a particular discipline. For example, to find an amplification for software engineering, you would look in the model for items labeled “For Software Engineering.” The same is true for other disciplines.



# New Definitions<sup>2</sup>

## bidirectional traceability

An association among two or more logical entities that is discernable in either direction (i.e., to and from an entity). (See also "requirements traceability" and "traceability.")

## customer requirement

The result of eliciting, consolidating, and resolving conflicts among the needs, expectations, constraints, and interfaces of the product's relevant stakeholders in a way that is acceptable to the customer. (See also "customer.")

.



# New Definitions<sup>3</sup>

## data

Recorded information, regardless of the form or method of recording, including technical data, computer software documents, financial information, management information, representation of facts, numbers, or datum of any nature that can be communicated, stored, and processed.

## functional configuration audit

An audit conducted to verify that the development of a configuration item has been completed satisfactorily, that the item has achieved the performance and functional characteristics specified in the functional or allocated configuration identification, and that its operational and support documents are complete and satisfactory. (See also "configuration audit," "configuration management," and "physical configuration audit.")



# New Definitions<sup>4</sup>

## hardware engineering

The application of a systematic, disciplined, and quantifiable approach to transform a set of requirements representing the collection of stakeholder needs, expectations, and constraints using documented techniques and technology to design, implement, and maintain a tangible product. (See also "software engineering" and "systems engineering.")

In CMMI, hardware engineering represents all technical fields (e.g., electrical or mechanical) that transform requirements and ideas into tangible and producible products .



# New Definitions<sup>5</sup>

## higher level management

The person or persons who provide the policy and overall guidance for the process, but do not provide the direct day-to-day monitoring and controlling of the process. Such persons belong to a level of management in the organization above the immediate level responsible for the process and can be (but are not necessarily) senior managers. (See also "senior manager.")

## physical configuration audit

An audit conducted to verify that a configuration item, as built, conforms to the technical documentation that defines and describes it. (See also, "configuration audit," "configuration management," and "functional configuration audit.")



# New Definitions<sup>6</sup>

## project startup

When a set of interrelated resources are directed to develop or deliver one or more products for a customer or end user. (See also "project.")

## service

In the CMMI Product Suite, a service is a product that is intangible and non-storable. (See also "product," "customer," and "work product.")



# Revised Definitions<sup>1</sup>

## acquisition

The process of obtaining products (goods and services) through contract.

## appraisal

In the CMMI Product Suite, an examination of one or more processes by a trained team of professionals using an appraisal reference model as the basis for determining, at a minimum, strengths and weaknesses. (See also “assessment” and “capability evaluation.”)

## appraisal findings

The results of an appraisal that identify the most important issues, problems, or opportunities for process improvement within the appraisal scope. Appraisal findings are inferences drawn from corroborated objective evidence.



# Revised Definitions<sup>2</sup>

## appraisal scope

The definition of the boundaries of the appraisal encompassing the organizational limits and the CMMI model limits within which the processes to be investigated operate.

## audit

In CMMI process improvement work, an objective examination of a work product or set of work products against specific criteria (e.g., requirements).



# Revised Definitions<sup>3</sup>

## capability evaluation

An appraisal by a trained team of professionals used as a discriminator to select suppliers, to monitor suppliers against the contract, or to determine and enforce incentives. Evaluations are used to gain insight into the process capability of a supplier organization and are intended to help decision makers make better acquisition decisions, improve subcontractor performance, and provide insight to a purchasing organization. (See also “appraisal” and “assessment.”)

## configuration audit

An audit conducted to verify that a configuration item, or a collection of configuration items that make up a baseline, conforms to a specified standard or requirement. (See also “audit,” “configuration item,” “functional configuration audit,” and “physical configuration audit.”)



# Revised Definitions<sup>4</sup>

## customer

The party (individual, project, or organization) responsible for accepting the product or for authorizing payment. The customer is external to the project (except possibly when integrated teams are used, as in IPPD), but not necessarily external to the organization. The customer may be a higher level project. Customers are a subset of stakeholders. (See also “stakeholder.”)

In most cases where this term is used, the preceding definition is intended; however, in some contexts, the term "customer" is intended to include other relevant stakeholders. (See also “customer requirement.”)



# Revised Definitions<sup>5</sup>

## data management

The disciplined processes and systems that plan for, acquire, and provide stewardship for business and technical data, consistent with data requirements, throughout the data lifecycle.

## establish and maintain

In the CMMI Product Suite, you will encounter goals and practices that include the phrase “establish and maintain.” This phrase means more than a combination of its component terms; it includes documentation and usage. For example, “Establish and maintain an organizational policy for planning and performing the organizational process focus process” means that not only must a policy be formulated, but it also must be documented, and it must be used throughout the organization.



# Revised Definitions<sup>6</sup>

## generic goal

A required model component that describes the characteristics that must be present to institutionalize the processes that implement a process area. (See also “institutionalization.”)

## objective evidence

As used in CMMI appraisal materials, documents or interview results used as indicators of the implementation or institutionalization of model practices. Sources of objective evidence can include instruments, presentations, documents, and interviews.



# Revised Definitions<sup>7</sup>

## process element

The fundamental unit of a process. A process can be defined in terms of subprocesses or process elements. A subprocess can be further decomposed into subprocesses or process elements; a process element cannot. (See also "process" and "subprocess.")

Each process element covers a closely related set of activities (e.g., estimating element and peer review element). Process elements can be portrayed using templates to be completed, abstractions to be refined, or descriptions to be modified or used. A process element can be an activity or task.



# Revised Definitions<sup>8</sup>

## product

In the CMMI Product Suite, a work product that is intended for delivery to a customer or end user. The form of a product can vary in different contexts. (See also “customer,” “product component,” “service,” and “work product.”)

## product component

In the CMMI Product Suite, a work product that is a lower level component of the product. Product components are integrated to produce the product. There may be multiple levels of product components. (See also “product” and “work product.”)



# Revised Definitions<sup>9</sup>

## project

In the CMMI Product Suite, a managed set of interrelated resources which delivers one or more products to a customer or end user. A project has a definite beginning (i.e., project startup) and typically operates according to a plan. Such a plan is frequently documented and specifies what is to be delivered or implemented, the resources and funds to be used, the work to be done, and a schedule for doing the work. A project can be composed of projects. (See also “project startup.”)



# Revised Definitions<sup>10</sup>

## quality and process-performance objectives

Objectives and requirements for product quality, service quality, and process performance. Process-performance objectives include quality; however, to emphasize the importance of quality in the CMMI Product Suite, the phrase quality and process-performance objectives is used rather than just process-performance objectives.

## requirements traceability

A discernable association between requirements and related requirements, implementations, and verifications. (See also "bidirectional traceability" and "traceability.")



# Revised Definitions<sup>11</sup>

## shared vision

A common understanding of guiding principles including mission, objectives, expected behavior, values, and final outcomes, which are developed and used by a project.

## subprocess

A process that is part of a larger process. A subprocess can be decomposed into subprocesses and/or process elements. (See also "process," "process description," and "process element.")

## traceability

A discernable association among two or more logical entities such as requirements, system elements, verifications, or tasks. (See also "bidirectional traceability" and "requirements traceability.")



# Revised Definitions<sup>12</sup>

## work product

In the CMMI Product Suite, a useful result of a process. This can include files, documents, products, parts of a product, services, process descriptions, specifications, and invoices. A key distinction between a work product and a product component is that a work product is not necessarily part of the product. (See also “product” and “product component.”)

In CMMI models, you will see the phrase work products and services. Even though the definition of work product includes services, this phrase is used to emphasize the inclusion of services in the discussion.



# Topics

Overview of Model Changes

Detailed Changes

Glossary Changes

Process Area Changes



# Process Area Improvements<sup>1</sup>

Improvements were made to all process areas; some process areas changed more than others. Only the process areas that were changed significantly will be addressed.

Many of these changes were discussed earlier. However, these slides show you significant changes by process area.



# Process Area Improvements<sup>2</sup>

The following process areas were improved significantly:

- Integrated Project Management +IPPD (IPM+IPPD)
- Organizational Process Definition +IPPD (OPD+IPPD)
- Organizational Process Focus (OPF)
- Requirements Management (REQM)
- Requirements Development (RD)
- Supplier Agreement Management (SAM)
- Technical Solution (TS)
- Validation (VAL)
- Verification (VER)



# Integrated Project Management +IPPD<sup>1</sup>

## Specific Goal

## Specific Practice

Use the Project's  
Defined Process

- 1.1 – Establish the Project's Defined Process
- 1.2 – Use Organizational Process Assets for Planning Project Activities
- 1.3 – Establish the Project's Work Environment
- 1.4 – Integrate Plans
- 1.5 – Manage the Project Using the Integrated Plans
- 1.6 – Contribute to the Organizational Process Assets

- Modified SP 1.1 from “Establish and maintain the project's defined process” to “Establish and maintain the project's defined process from project startup through the life of the project.”
- Added SP 1.3 “Establish the Project's Work Environment.” (This practice is new to CMMI.)



# Integrated Project Management +IPPD<sup>2</sup>

## Specific Goal

## Specific Practice

Coordinate and  
Collaborate with  
Relevant Stakeholders

2.1 – Manage Stakeholder Involvement  
2.2 – Manage Dependencies  
2.3 – Resolve Coordination Issues

Apply IPPD Principles

3.1 – Establish the Project’s Shared  
Vision  
3.2 – Establish the Integrated Team  
Structure  
3.3 – Allocate Requirements to  
Integrated Teams  
3.4 – Establish Integrated Teams  
3.5 – Ensure Collaboration among  
Interfacing Teams

- Reduced the IPPD Addition to one goal (SG3 “Apply IPPD Principles”) and its practices.
- To emphasize the IPPD Addition, the name of this process area is now “Integrated Project Management +IPPD” or “IPM +IPPD.”



# Organizational Process Definition +IPPD<sup>1</sup>

## Specific Goal

## Specific Practice

Establish Organizational  
Process Assets

1.1 – Establish Standard Processes

1.2 – Establish Lifecycle Model  
Descriptions

1.3 – Establish Tailoring Criteria and  
Guidelines

1.4 – Establish the Organization’s  
Measurement Repository

1.5 – Establish the Organization’s Process  
Asset Library

**1.6 – Establish Work Environment  
Standards**

- Added “and work environment standards” to the purpose statement.
- Added SP 1.6 “Establish Work Environment Standards.” (This practice is new to CMMI.)



# Organizational Process Definition +IPPD<sup>2</sup>

## Specific Goal

## Specific Practice

**Enable IPPD Management**

**2.1 – Establish Empowerment Mechanisms**

**2.2 – Establish Rules and Guidelines for Integrated Teams**

**2.3 – Balance Team and Home Organization Responsibilities**

- 
- Added an IPPD Addition to OPD (SG2 “Enable IPPD Management” and its practices).
  - To emphasize the IPPD Addition, the name the process area is now “Organizational Process Definition +IPPD” or “OPD +IPPD.”



# Organizational Process Focus<sup>1</sup>

## Specific Goal

Determine Process Improvement Opportunities

## Specific Practice

1.1 – Establish Organizational Process Needs

1.2 – Appraise the Organization's Processes

1.3 – Identify the Organization's Process Improvements

- Modified the purpose statement to emphasize deployment.
- SP 1.2 “Appraise the organization's processes periodically and as needed to maintain an understanding of their strengths and weaknesses.” uses “organization's processes” instead of “processes of the organization.”



# Organizational Process Focus<sup>2</sup>

## Specific Goal

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**Plan and Implement  
Process  
Improvements**

## Specific Practice

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**2.1 – Establish Process Action Plans  
2.2 – Implement Process Action Plans**

- 
- Modified SG2 from “Plan and Implement Process Improvement Activities” to “Plan and Implement Process Improvements.”
  - Moved to a new SG3 and modified what were SP 2.3 and SP 2.4 in v1.1.



# Organizational Process Focus<sup>3</sup>

## Specific Goal

## Specific Practice

**Deploy Organizational Process Assets and Incorporate Lessons Learned**

**3.1 – Deploy Organizational Process Assets**

**3.2 – Deploy Standard Processes**

**3.3 – Monitor Implementation**

**3.4 – Incorporate Process-Related Experiences into the Organizational Process Assets**

- Added new SG3, “Deploy Organizational Process Assets and Incorporate Lessons Learned.”
- Moved what were SP 2.3 and SP 2.4 in v1.1 to the new SG3 as SP 3.1 and SP 3.4.
- Added two new SPs: SP 3.2 “Deploy Standard Processes,” and SP 3.3 “Monitor Implementation.”



# Requirements Management

## Specific Goal

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Manage Requirements

## Specific Practice

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1.1 – Obtain an Understanding of Requirements

1.2 – Obtain Commitment to Requirements

1.3 – Manage Requirements Changes

**1.4 – Maintain Bidirectional Traceability of Requirements**

1.5 – Identify Inconsistencies Between Project Work and Requirements

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- V1.2 REQM SP 1.4 practice statement now reads, “Maintain bidirectional traceability among the requirements and work products.”
- Project plans are no longer mentioned in this SP statement.
- The description of bidirectional traceability is improved as is its definition in the glossary.



# Requirements Development<sup>1</sup>

## Specific Goal

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## Specific Practice

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Develop Customer Requirements

- 1.1 – Elicit Needs
  - 1.2 – Develop the Customer Requirements
- 

Develop Product Requirements

- 2.1 – Establish Product and Product Component Requirements
  - 2.2 – Allocate Product Component Requirements
  - 2.3 – Identify Interface Requirements
- 

- Former base practice “Collect Stakeholder Needs” is eliminated and former advanced practice, “Elicit Needs” is kept.
- Informative text is added to the introductory notes about applying RD to maintenance projects.



# Requirements Development<sup>2</sup>

## Specific Goal

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Analyze and Validate Requirements

## Specific Practice

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**3.1 – Establish Operational Concepts and Scenarios**

**3.2 – Establish a Definition of Required Functionality**

**3.3 – Analyze Requirements**

**3.4 – Analyze Requirements to Achieve Balance**

**3.5 – Validate Requirements**

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- Material from V1.1 TS SP 1.2, “Evolve Operational Concepts and Scenarios,” is incorporated into RD SP 3.1.
- Material from V1.1 RD SP 3.5-1, “Validate Requirements,” and RD SP 3.5-2, “Validate Requirements with Comprehensive Methods” were consolidated into a single practice.



# Supplier Agreement Management

## Specific Goal

## Specific Practice

Establish Supplier Agreements

- 1.1 – Determine Acquisition Type
- 1.2 – Select Suppliers
- 1.3 – Establish Supplier Agreements

Satisfy Supplier Agreements

- 2.1 – Execute the Supplier Agreement
- 2.2 – Monitor Selected Supplier Processes
- 2.3 – Evaluate Selected Supplier Work Products
- 2.4 – Accept the Acquired Product
- 2.5 – Transition Products

- V1.1 SAM SP2.1 “Review COTS Products,” was eliminated. “Identify candidate COTS products that satisfy requirements” is a new subpractice under the Technical Solutions Process Area SP1.1, “Develop Alternative Solutions and Selection Criteria.”
- SP2.2 and SP2.3 were added because ISM was eliminated.
- The purpose of SAM was also updated.



# Technical Solution<sup>1</sup>

## Specific Goal

Select Product-  
Component Solutions

## Specific Practice

**1.1 – Develop Alternative Solutions and Selection Criteria**

**1.2 – Select Product-Component Solutions**

- V1.1 TS SP 1.1-1, “Develop Alternative Solutions and Selection Criteria,” and TS SP 1.1-2, “Develop Detailed Alternative Solutions and Selection Criteria” are consolidated into a single practice.
- “Identify candidate COTS products that satisfy requirements” is a new subpractice under SP1.1.
- V1.1 TS SP 1.2 “Evolve Operational Concepts and Scenarios” is incorporated into RD SP 3.1, “Establish Operational Concepts and Scenarios.”



# Technical Solution<sup>2</sup>

## Specific Goal

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Develop the Design

## Specific Practice

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2.1 – Design the Product or Product Component

2.2 – Establish a Technical Data Package

**2.3 – Design Interfaces Using Criteria**

2.4 – Perform Make, Buy, or Reuse Analyses

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Implement the Product Design

3.1 – Implement the Design

3.2 – Develop Product Support Documentation

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- V1.1 TS SP 2.3-1, “Establish Interface Descriptions,” and TS SP 2.3-3, “Design Interfaces Using Criteria” are consolidated into a single practice.



# Validation

## Specific Goal

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Prepare for Validation

## Specific Practice

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1.1 – Select Products for Validation

1.2 – Establish the Validation Environment

1.3 – Establish Validation Procedures and Criteria

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Validate Product or Product Components

2.1 – Perform Validation

**2.2 – Analyze Validation Results**

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- Notes were added to VAL to stress that validation activities are performed incrementally and involve relevant stakeholders.
- The phrase “and identify issues” was deleted from the statement of SP 2.2 “Analyze Validation Results” to maintain parallelism with VER SP 3.2 “Analyze Verification Results.”



# Verification<sup>1</sup>

## Specific Goal

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Prepare for Verification

## Specific Practice

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1.1 – Select Work Products for Verification

1.2 – Establish the Verification Environment

1.3 – Establish Verification Procedures and Criteria

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Perform Peer Reviews

2.1 – Prepare for Peer Reviews

2.2 – Conduct Peer Reviews

2.3 – Analyze Peer Review Data

- 
- No changes to SG1, SG2, or their practices.



# Verification<sup>2</sup>

## Specific Goal

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**Verify Selected Work Products**

## Specific Practice

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**3.1 – Perform Verification**

**3.2 – Analyze Verification Results**

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- The phrase “and identify corrective action” was deleted from both the title and statement of SP 3.2 “Analyze Verification Results. (Corrective action is handled in PMC SG2, “Manage Corrective Action to Closure.)”



# Summary

Many changes were made to the CMMI models to improve quality. The major changes include

- name changed to “CMMI for Development”
- both representations in one document
- amplifications improved; added hardware amplifications
- common features and advanced practices eliminated
- SS addition eliminated; ISM brought into SAM
- guidelines for “not applicable” process areas clarified
- overview and glossary improved
- work environment material added to OPD and IPM
- IPPD material simplified and consolidated
- process deployment strengthened in IPM and OPF