SEI CMMI - QUICK GUIDE

SEI CMMI - OVERVIEW

Process improvement is continuous improvement.

We can never reach perfection. In this tutorial, we will learn CMM that is continuously evolving and improving model where the focus is always on doing better.

Our reach should always exceed our grasp.

What is CMM?

- CMM stands for **C**apability **M**aturity **M**odel.
- Focuses on elements of essential practices and processes from various bodies of knowledge.
- Describes common sense, efficient, proven ways of doing business *whichyoushouldalreadybedoing* - not a radical new approach.
- CMM is a method to evaluate and measure the maturity of the software development process of an organization.
- CMM measures the maturity of the software development process on a scale of 1 to 5.
- CMM v1.0 was developed by the Software Engineering Institute *SEI* at Carnegie Mellon University in Pittsburgh, USA.
- CMM was originally developed for Software Development and Maintenance but later it was developed for :
    - Systems Engineering
    - Supplier Sourcing
    - Integrated Product and Process Development
    - People CMM
    - Software Acquisition

CMM Examples

- People CMM: Develop, motivate and retain project talent.
- Software CMM: Enhance a software focused development and maintenance capability.

What is Maturity?

Definitions vary but mature processes are generally thought to be:

- Well-defined,
- Repeatable,
- Measured,
- Analyzed,
- Improved, and
- Effective.

Poor but mature processes are just as bad as no maturity at all!

CMM helps to solve the maturity problem by defining a set of practices and providing a general framework for improving them. The focus of CMM is on identifying key process areas and the

exemplary practices that may comprise a disciplined software process.

Immature vs Mature Organization

An immature organization would have the following characteristics:

- Process improvised during project
- Approved processes being ignored
- Reactive, not proactive
- Unrealistic budget and schedule
- Quality sacrificed for schedule
- No objective measure of quality

In contrast, the characteristics of a mature organization are as follows:

- Inter-group communication and coordination
- Work accomplished according to plan
- Practices consistent with processes
- Processes updated as necessary
- Well-defined roles/responsibilities
- Management formally commits

What is CMMI?

CMM Integration project was formed to sort out the problem of using multiple CMMs. CMMI product team's mission was to combine three **Source Models** into a single improvement framework for the organizations pursuing enterprise-wide process improvement. These three Source Models are:

- Capability Maturity Model for Software $SW-CMM$ - v2.0 Draft C.
- Electronic Industries Alliance Interim Standard EIA/IS - 731 Systems Engineering.
- Integrated Product Development Capability Maturity Model $IPD-CMM$ v0.98.

CMM Integration:

- Builds an initial set of integrated models.
- Improves best practices from source models based on lessons learned.
- Establishes a framework to enable integration of future models.

Difference between CMM and CMMI

CMM is a reference model of matured practices in a specified discipline like Systems Engineering CMM, Software CMM, People CMM, Software Acquisition CMM etc., but they were difficult to integrate as and when needed.

CMMI is the successor of the CMM and evolved as a more matured set of guidelines and was built combining the best components of individual disciplines of CMM$SoftwareCMM$, $PeopleCMM$, $etc.$. It can be applied to product manufacturing, people management, software development, etc.

CMM describes about the software engineering alone where as CMM Integrated describes both software and system engineering. CMMI also incorporates the Integrated Process and Product Development and the supplier sourcing.

CMMI and Business Objectives

The objectives of CMMI are very obvious. They are as follows:

- **Produce quality products or services** : The process-improvement concept in CMMI

models evolved out of the Deming, Juran, and Crosby quality paradigm: Quality products are a result of quality processes. CMMI has a strong focus on quality-related activities including requirements management, quality assurance, verification, and validation.

- **Create value for the stockholders** : Mature organizations are more likely to make better cost and revenue estimates than those with less maturity, and then perform in line with those estimates. CMMI supports quality products, predictable schedules, and effective measurement to support the management in making accurate and defensible forecasts. This process maturity can guard against project performance problems that could weaken the value of the organization in the eyes of investors.
- **Enhance customer satisfaction** : Meeting cost and schedule targets with high-quality products that are validated against customer needs is a good formula for customer satisfaction. CMMI addresses all of these ingredients through its emphasis on planning, monitoring, and measuring, and the improved predictability that comes with more capable processes.
- **Increase market share** : Market share is a result of many factors, including quality products and services, name identification, pricing, and image. Customers like to deal with suppliers who have a reputation for meeting their commitments.
- **Gain an industry-wide recognition for excellence** : The best way to develop a reputation for excellence is to consistently perform well on projects, delivering quality products and services within cost and schedule parameters. Having processes that conform to CMMI requirements can enhance that reputation.

SEI CMMI MODELS - DISCIPLINES

The CMM Integration is a model that has integrated several disciplines / bodies of knowledge. Currently there are four bodies of knowledge available to you when selecting a CMMI model.

Systems Engineering

Systems engineering covers the development of complete systems, which may or may not include software. Systems engineers focus on transforming customer needs, expectations, and constraints into product solutions and supporting these product solutions throughout the entire lifecycle of the product.

Software Engineering

Software engineering covers the development of software systems. Software engineers focus on the application of systematic, disciplined, and quantifiable approaches to the development, operation, and maintenance of software.

Integrated Product and Process Development

Integrated Product and Process Development *IPPD* is a systematic approach that achieves a timely collaboration of relevant stakeholders throughout the life of the product to better satisfy customer needs, expectations, and requirements. The processes to support an IPPD approach are integrated with the other processes in the organization.

If a project or organization chooses IPPD, it performs the IPPD best practices concurrently with other best practices used to produce products *e. g.* , *thoserelatedtosystemsengineering*. That is, if an organization or project wishes to use IPPD, it must select one or more disciplines in addition to IPPD.

Supplier Sourcing

As work efforts become more complex, project managers may use suppliers to perform functions or add modifications to products that are specifically needed by the project. When those activities are critical, the project benefits from enhanced source analysis and from monitoring supplier activities before product delivery. Under these circumstances, the supplier sourcing discipline covers the acquisition of products from suppliers.

Similar to IPPD best practices, supplier sourcing best practices must be selected in conjunction with

best practices used to produce products.

CMMI Discipline Selection

Selecting a discipline may be a difficult step and depends on what an organization wants to improve.

- If you are improving your systems engineering processes, like Configuration Management, Measurement and Analysis, Organizational Process Focus, Project Monitoring and Control, Process and Product Quality Assurance, Risk Management, Supplier Agreement Management etc., then you should select Systems engineering *SE* discipline. The discipline amplifications for systems engineering receive special emphasis.
- If you are improving your integrated product and process development processes like Integrated Teaming, Organizational Environment for Integration, then you should select IPPD. The discipline amplifications for IPPD receive special emphasis.
- If you are improving your source selection processes like Integrated Supplier Management then you should select Supplier sourcing *SS*. The discipline amplifications for supplier sourcing receive special emphasis.
- If you are improving multiple disciplines, then you need to work on all the areas related to those disciplines and pay attention to all of the discipline amplifications for those disciplines.

We will discuss different areas related to CMMI implementation in subsequent chapters.

SEI CMMI - REPRESENTATIONS

The CMMI is structured as follows:

- Maturity Levels *stagedrepresentation* or Capability Levels *continuousrepresentation*
- Process Areas
- Goals: Generic and Specific
- Common Features
- Practices: Generic and Specific

This chapter will discuss about two CMMI representations and rest of the subjects will be covered in subsequent chapters.

A representation allows an organization to pursue different improvement objectives. An organization can go for one of the following two improvement paths.

Staged Representation

The staged representation is the approach used in the Software CMM. It is an approach that uses predefined sets of process areas to define an improvement path for an organization. This improvement path is described by a model component called a Maturity Level. A maturity level is a well-defined evolutionary plateau towards achieving improved organizational processes.

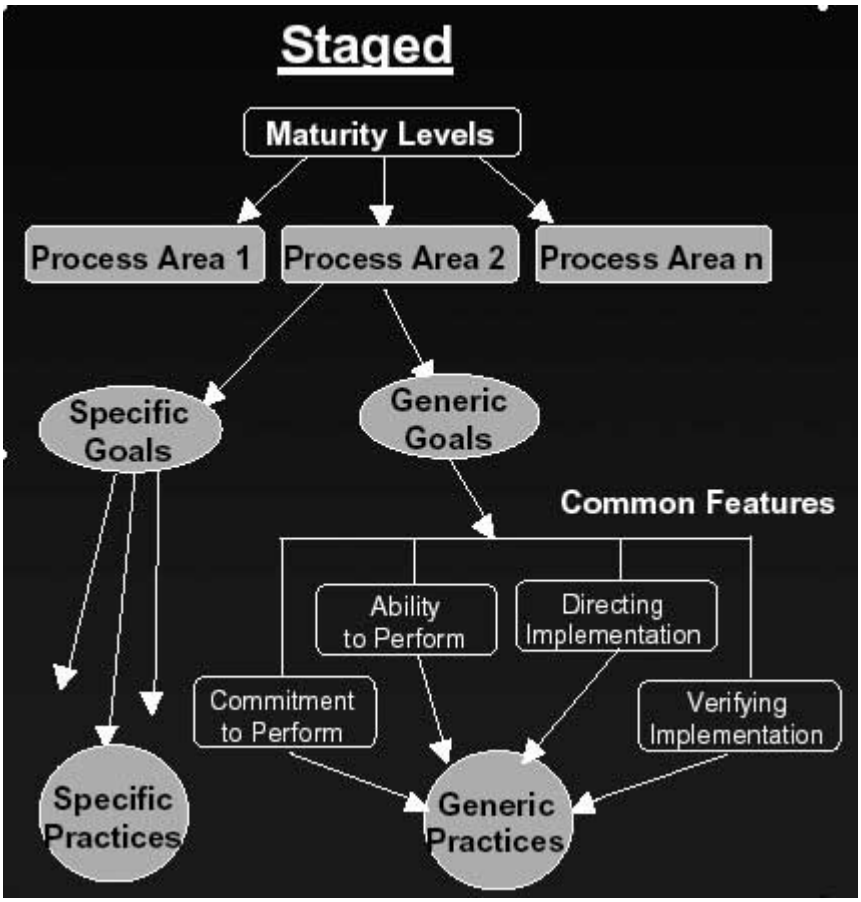
CMMI Staged Representation:

- Provides a proven sequence of improvements, each serving as a foundation for the next.
- Permits comparisons across and among organizations by the use of maturity levels.
- Provides an easy migration from the SW-CMM to CMMI.
- Provides a single rating that summarizes appraisal results and allows comparisons among organizations.

Thus Staged Representation provides a pre-defined roadmap for organizational improvement based on proven grouping and ordering of processes and associated organizational relationships. You cannot divert from the sequence of steps.

CMMI Staged Structure

Following picture illustrates CMMI Staged Model Structure.



Continuous Representation

Continuous representation is the approach used in the SECM and the IPD-CMM. This approach allows an organization to select a specific process area and make improvements based on it. The continuous representation uses Capability Levels to characterize improvement relative to an individual process area.

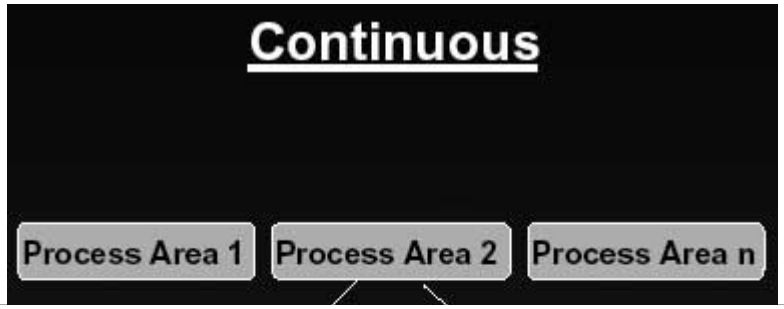
CMMI Continuous Representation:

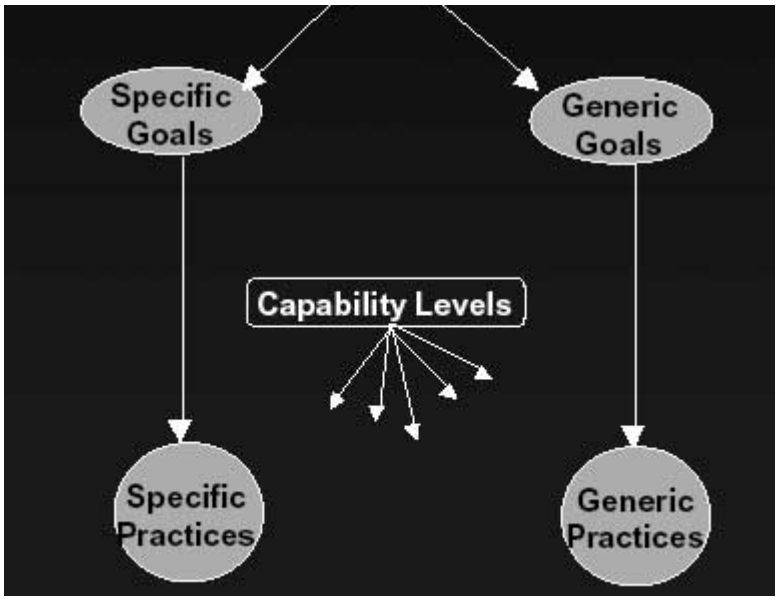
- Allows you to select the order of improvement that best meets your organization's business objectives and mitigates your organization's areas of risk.
- Enables comparisons across and among organizations on a process-area-by-process-area basis.
- Provides an easy migration from EIA 731 *andothermodelswithacontinuousrepresentation* to CMMI.

Thus Continuous Representation provides flexibility to organizations to choose the processes for improvement, as well as the amount of improvement required.

CMMI Continuous Structure

The following picture illustrates the CMMI Continuous Model Structure.





Continuous vs Staged Representations

Continuous Representation	Staged Representation
Process areas are organized by process area categories.	Process areas are organized by maturity levels.
Improvement is measured using capability levels. Capability levels measure the maturity of a particular process across an organization; it ranges from 0 through 5.	Improvement is measured using maturity levels. Maturity levels measure the maturity of a set of processes across an organization: it ranges from 1 through 5.
There are two types of specific practices: base and advanced. All specific practices appear in the continuous representation.	There is only one type of specific practice. The concepts of base and advanced practices are not used. All specific practices appear in the staged representation except when a related base-advanced pair of practices appears in the continuous representation, in which case only the advanced practice appears in the staged representation.
Capability levels are used to organize the generic practices.	Common features are used to organize generic practices.
All generic practices are included in each process area.	Only the level 2 and level 3 generic practices are included.
Equivalent staging allows determination of a maturity level from an organization's achievement profile.	There is no need for an equivalence mechanism to back the continuous representation because each organization can choose what to improve and how much to improve using the staged representation.

Which Representation is Better?

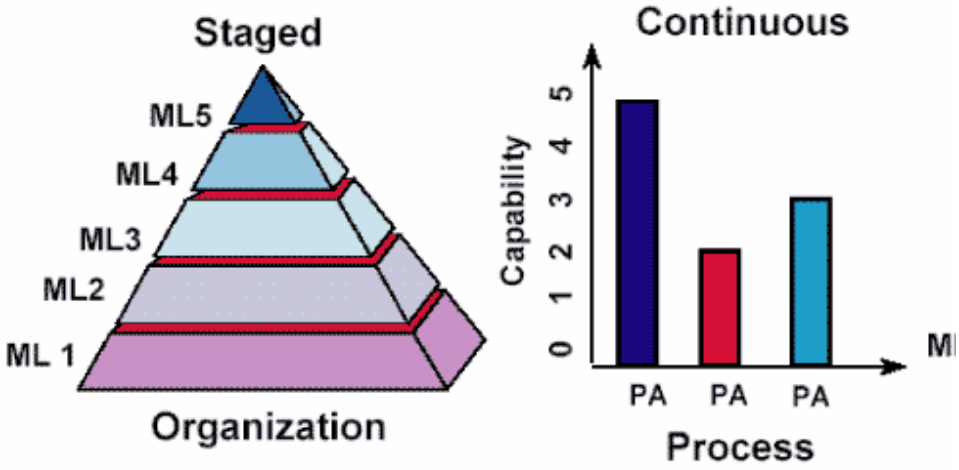
Each representation has its advantages over the other, some organizations use both representations to address particular requirements at various times in their improvement programs.

Organizational maturity is the focus of the staged representation, whereas process area capability is the focus of the continuous representation.

Organizational maturity and process area capability are similar concepts. The difference between them is that organizational maturity pertains to a set of process areas across an organization,

while process area capability deals with a set of processes relating to a single process area or specific practice.

The following diagram depicts both the presentations. In this diagram, **ML** indicates Maturity Level and **PA** Indicates Process Area.



CMMI - MATURITY LEVELS

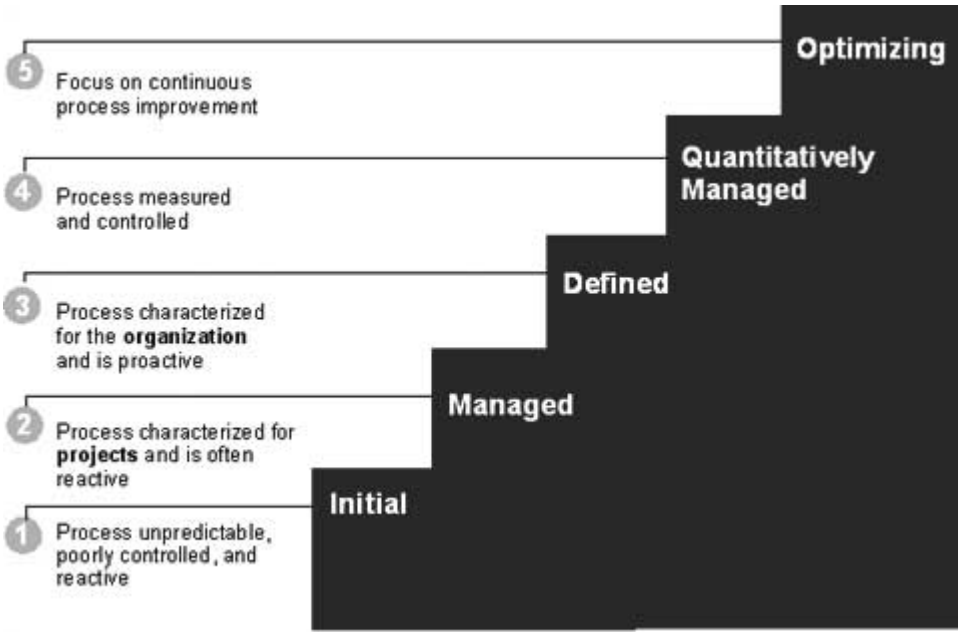
A maturity level is a well-defined evolutionary plateau toward achieving a mature software process. Each maturity level provides a layer in the foundation for continuous process improvement.

CMMI models with staged representation, have five maturity levels designated by the numbers 1 through 5. They are:

- Initial
- Managed
- Defined
- Quantitatively Managed
- Optimizing

CMMI Staged Representation Maturity Levels

The following image shows the maturity levels in a CMMI staged representation.



Now we will learn the details about each maturity level. Next section will list down all the process areas related to these maturity levels.

Maturity Level Details

Maturity levels consist of a predefined set of process areas. The maturity levels are measured by the achievement of the **specific** and **generic goals** that apply to each predefined set of process areas. The following sections describe the characteristics of each maturity level in detail.

Maturity Level 1 Initial

At maturity level 1, processes are usually ad hoc and chaotic. The organization usually does not provide a stable environment. Success in these organizations depend on the competence and heroics of the people in the organization and not on the use of proven processes.

Maturity level 1 organizations often produce products and services that work; however, they frequently exceed the budget and schedule of their projects.

Maturity level 1 organizations are characterized by a tendency to over commit, abandon processes in the time of crisis, and not be able to repeat their past successes.

Maturity Level 2 Managed

At maturity level 2, an organization has achieved all the **specific** and **generic goals** of the maturity level 2 process areas. In other words, the projects of the organization have ensured that requirements are managed and that processes are planned, performed, measured, and controlled.

The process discipline reflected by maturity level 2 helps to ensure that existing practices are retained during times of stress. When these practices are in place, projects are performed and managed according to their documented plans.

At maturity level 2, requirements, processes, work products, and services are managed. The status of the work products and the delivery of services are visible to management at defined points.

Commitments are established among relevant stakeholders and are revised as needed. Work products are reviewed with stakeholders and are controlled.

The work products and services satisfy their specified requirements, standards, and objectives.

Maturity Level 3 Defined

At maturity level 3, an organization has achieved all the **specific** and **generic goals** of the process areas assigned to maturity levels 2 and 3.

At maturity level 3, processes are well characterized and understood, and are described in standards, procedures, tools, and methods.

A critical distinction between maturity level 2 and maturity level 3 is the scope of standards, process descriptions, and procedures. At maturity level 2, the standards, process descriptions, and procedures may be quite different in each specific instance of the process *forexample, onaparticularproject*.

At maturity level 3, the standards, process descriptions, and procedures for a project are tailored from the organization's set of standard processes to suit a particular project or organizational unit. The organization's set of standard processes includes the processes addressed at maturity level 2 and maturity level 3. As a result, the processes that are performed across the organization are consistent except for the differences allowed by the tailoring guidelines.

Another critical distinction is that at maturity level 3, processes are typically described in more detail and more rigorously than at maturity level 2. At maturity level 3, processes are managed more proactively using an understanding of the interrelationships of the process activities and detailed measures of the process, its work products, and its services.

Maturity Level 4 Quantitatively Managed

At maturity level 4, an organization has achieved all the **specific goals** of the process areas assigned to maturity levels 2, 3, and 4 and the **generic goals** assigned to maturity levels 2 and 3.

At maturity level 4, sub-processes are selected that significantly contribute to the overall process performance. These selected sub-processes are controlled using statistical and other quantitative techniques.

Quantitative objectives for quality and process performance are established and used as criteria in managing the processes. Quantitative objectives are based on the needs of the customer, end users, organization, and process implementers. Quality and process performance are understood in statistical terms and are managed throughout the life of the processes.

For these processes, detailed measures of process performance are collected and statistically analyzed. Special causes of process variation are identified and, where appropriate, the sources of special causes are corrected to prevent future occurrences.

Quality and process performance measures are incorporated into the organization's measurement repository to support fact-based decision making in the future.

A critical distinction between maturity level 3 and maturity level 4 is the predictability of process performance. At maturity level 4, the performance of processes is controlled using statistical and other quantitative techniques, and is quantitatively predictable. At maturity level 3, processes are only qualitatively predictable.

Maturity Level 5 Optimizing

At maturity level 5, an organization has achieved all the **specific goals**of the process areas assigned to maturity levels 2, 3, 4, and 5 and the **generic goals** assigned to maturity levels 2 and 3.

Processes are continually improved based on a quantitative understanding of the common causes of variation inherent in processes.

This level focuses on continually improving process performance through both incremental and innovative technological improvements.

The quantitative process-improvement objectives for the organization are established, continually revised to reflect changing business objectives, and used as criteria in managing process improvement.

The effects of deployed process improvements are measured and evaluated against the quantitative process-improvement objectives. Both the defined processes and the organization's set of standard processes are targets of measurable improvement activities.

Optimizing processes that are agile and innovative, depends on the participation of an empowered workforce aligned with the business values and objectives of the organization. The organization's ability to rapidly respond to changes and opportunities is enhanced by finding ways to accelerate and share learning. Improvement of the processes is inherently a role that everybody has to play, resulting in a cycle of continual improvement.

A critical distinction between maturity level 4 and maturity level 5 is the type of process variation addressed. At maturity level 4, processes are concerned with addressing special causes of process variation and providing statistical predictability of the results. Though processes may produce predictable results, the results may be insufficient to achieve the established objectives. At maturity level 5, processes are concerned with addressing common causes of process variation and changing the process *thatis, shiftingthemeansoftheprocessperformance* to improve process performance *whilemaintainingstatisticalpredictability* to achieve the established quantitative process-improvement objectives.

Maturity Levels Should Not be Skipped

Each maturity level provides a necessary foundation for effective implementation of processes at the next level.

- Higher level processes have less chance of success without the discipline provided by lower levels.

- The effect of innovation can be obscured in a noisy process.

Higher maturity level processes may be performed by organizations at lower maturity levels, with the risk of not being consistently applied in a crisis.

Maturity Levels and Process Areas

Here is a list of all the corresponding process areas defined for a software organization. These process areas may be different for different organization.

This section provides the names of the related process areas. For more details about these Process Areas go through the CMMI Process Areas Chapter.

Level	Focus	Key Process Area	Result
5 Optimizing	Continuous Process Improvement	Organizational Innovation and Deployment Causal Analysis and Resolution	Highest Quality / Lowest Risk
4 Quantitatively Managed	Quantitatively Managed	Organizational Process Performance Quantitative Project Management	Higher Quality / Lower Risk
3 Defined	Process Standardization	Requirements Development Technical Solution Product Integration Verification Validation Organizational Process Focus Organizational Process Definition Organizational Training Integrated Project Mgmt *withIPPDextras* Risk Management Decision Analysis and Resolution Integrated Teaming *IPPDonly* Org. Environment for Integration *IPPDonly* Integrated Supplier Management *SSonly*	Medium Quality / Medium Risk
2 Managed	Basic Project Management	Requirements Management Project Planning Project Monitoring and Control	Low Quality / High Risk

		Supplier Agreement Management Measurement and Analysis Process and Product Quality Assurance Configuration Management	
1 Initial	Process is informal and Adhoc		Lowest Quality / Highest Risk

CMMI - CAPABILITY LEVELS

A capability level is a well-defined evolutionary plateau describing the organization's capability relative to a process area. A capability level consists of related specific and generic practices for a process area that can improve the organization's processes associated with that process area. Each level is a layer in the foundation for continuous process improvement.

Thus, capability levels are cumulative, i.e., a higher capability level includes the attributes of the lower levels.

In CMMI models with a continuous representation, there are six capability levels designated by the numbers 0 through 5.

- 0 - Incomplete
- 1 - Performed
- 2 - Managed
- 3 - Defined
- 4 - Quantitatively Managed
- 5 - Optimizing

A short description of each capability level is as follows:

Capability Level 0: Incomplete

An "incomplete process" is a process that is either not performed or partially performed. One or more of the specific goals of the process area are not satisfied and no generic goals exist for this level since there is no reason to institutionalize a partially performed process.

This is tantamount to Maturity Level 1 in the staged representation.

Capability Level 1: Performed

A Capability Level 1 process is a process that is expected to perform all of the Capability Level 1 specific and generic practices. Performance may not be stable and may not meet specific objectives such as quality, cost, and schedule, but useful work can be done. This is only a start, or baby-step, in process improvement. It means that you are doing something but you cannot prove that it is really working for you.

Capability Level 2: Managed

A managed process is planned, performed, monitored, and controlled for individual projects, groups, or stand-alone processes to achieve a given purpose. Managing the process achieves both the model objectives for the process as well as other objectives, such as cost, schedule, and

quality. As the title of this level indicates, you are actively managing the way things are done in your organization. You have some metrics that are consistently collected and applied to your management approach.

Note : metrics are collected and used at all levels of the CMMI, in both the staged and continuous representations. It is a bitter fallacy to think that an organization can wait until Capability Level 4 to use the metrics.

Capability Level 3: Defined

A capability level 3 process is characterized as a "defined process." A defined process is a managed *capabilitylevel2* process that is tailored from the organization's set of standard processes according to the organization's tailoring guidelines, and contributes work products, measures, and other process-improvement information to the organizational process assets.

Capability Level 4: Quantitatively Managed

A capability level 4 process is characterized as a "quantitatively managed process." A quantitatively managed process is a defined *capabilitylevel3* process that is controlled using statistical and other quantitative techniques. Quantitative objectives for quality and process performance are established and used as criteria in managing the process. Quality and process performance is understood in statistical terms and is managed throughout the life of the process.

Capability Level 5: Optimizing

An optimizing process is a quantitatively managed process that is improved, based on an understanding of the common causes of process variation inherent to the process. It focuses on continually improving process performance through both incremental and innovative improvements. Both the defined processes and the organization's set of standard processes are the targets of improvement activities.

Capability Level 4 focuses on establishing baselines, models, and measurements for process performance. Capability Level 5 focuses on studying performance results across the organization or entire enterprise, finding common causes of problems in how the work is done *theprocess*[*es*]*used*, and fixing the problems in the process. The fix would include updating the process documentation and training involved where the errors were injected.

Organization of Process Areas in Continuous Representation

Category	Process Area
Project Management	• Project Planning • Project Monitoring and Control • Supplier Agreement Management • Integrated Project Management*IPPD* • Integrated Supplier Management *SS* • Integrated Teaming *IPPD* • Risk Management Quantitative Project Management
Support	• Configuration Management • Process and Product Quality Assurance • Measurement and Analysis Causal Analysis and Resolution • Decision Analysis and Resolution • Organizational Environment for Integration *IPPD*

Engineering	• Requirements Management • Requirements Development • Technical Solution • Product Integration • Verification • Validation
Process Management	• Organizational Process Focus • Organizational Process Definition • Organizational Training • Organizational Process Performance • Organizational Innovation and Deployment

CMMI - KEY PROCESS AREAS

A Process Area is a cluster of related practices in an area that, when implemented collectively, satisfy a set of goals considered important for making significant improvement in that area. All CMMI process areas are common to both continuous and staged representations.

The continuous representation enables the organization to choose the focus of its process improvement efforts by choosing those process areas, or sets of interrelated process areas, that best benefit the organization and its business objectives. Although there are some limits on what an organization can choose because of the dependencies among process areas, the organization has considerable freedom in its selection.

Once you select the process areas, you must also select how much you would like to improve the processes associated with those process areas $i.e., selecttheappropriatecapabilitylevel$. Capability levels, and generic goals and practices, support the improvement of processes in individual process areas.

Conversely, you will see that the staged representation encourages you to always look at process areas in the context of the maturity level to which they belong. The process areas are organized by maturity levels to reinforce this concept. When you use a process area, you use the entire process area i.e, all goals and all practices.

The CMMI Process Areas PAs can be grouped into the following four categories to understand their interactions and links with one another regardless of their defined levels:

- Process Management
- Project Management
- Engineering
- Support

Each process area is defined by a set of goals and practices. There are two categories of goals and practices:

- **Generic goals and practices** : They are a part of every process area.
- **Specific goals and practices** : They are specific to a given process area.

A process area is satisfied when the processes of a company cover all of the generic and specific goals and practices for that process area.

Generic Goals and Practices

Generic goals and practices are a part of every process area.

NOTATIONS : GG --> Generic Goals and GP --> Generic Practice

- GG 1 Achieve Specific Goals
    - GP 1.1 Perform Specific Practices
- GG 2 Institutionalize a Managed Process
    - GP 2.1 Establish an Organizational Policy
    - GP 2.2 Plan the Process
    - GP 2.3 Provide Resources
    - GP 2.4 Assign Responsibility
    - GP 2.5 Train People
    - GP 2.6 Manage Configurations
    - GP 2.7 Identify and Involve Relevant Stakeholders
    - GP 2.8 Monitor and Control the Process
    - GP 2.9 Objectively Evaluate Adherence
    - GP 2.10 Review Status with Higher Level Management
- GG 3 Institutionalize a Defined Process
    - GP 3.1 Establish a Defined Process
    - GP 3.2 Collect Improvement Information
- GG 4 Institutionalize a Quantitatively Managed Process
    - GP 4.1 Establish Quantitative Objectives for the Process
    - GP 4.2 Stabilize Sub process Performance
- GG 5 Institutionalize an Optimizing Process
    - GP 5.1 Ensure Continuous Process Improvement
    - GP 5.2 Correct Root Causes of Problems

Common Features

The common features are attributes that indicate whether the implementation and institutionalization of a key process area is effective, repeatable, and lasting. The five common features are listed below:

- **Commitment to Perform** : Commitment to Perform describes the actions, the organization must take to ensure that the process is established and will endure. Commitment to Perform typically involves establishing organizational policies and senior management sponsorship.
- **Ability to Perform** : Ability to Perform describes the preconditions that must exist in the project or organization to implement the software process competently. Ability to Perform typically involves resources, organizational structures, and training.
- **Activities Performed** : Activities Performed describes the roles and procedures necessary to implement a key process area. Activities Performed typically involve establishing plans and procedures, performing the work, tracking it, and taking corrective actions as necessary.
- **Measurement and Analysis** : Measurement and Analysis describes the need to measure the process and analyze the measurements. Measurement and Analysis typically includes examples of the measurements that could be taken to determine the status and

effectiveness of the Activities Performed.

- **Verifying Implementation** : Verifying Implementation describes the steps to ensure that the activities are performed in compliance with the process that has been established. Verification typically encompasses reviews and audits by management and software quality assurance.

The practices in the common feature Activities Performed describe what must be implemented to establish a process capability. The other practices, taken as a whole, form the basis by which an organization can institutionalize the practices described in the Activities Performed common feature.

Process Areas in Detail

The CMMI contains 22 process areas indicating the aspects of product development that are to be covered by company processes.

Causal Analysis and Resolution

- It is a support process area at Maturity Level 5.

Purpose

The purpose of **Causal Analysis and Resolution** *CAR* is to identify causes of defects and other problems and take action to prevent them from occurring in the future.

Specific Practices by Goal

- SG 1 Determine Causes of Defects
  - SP 1.1 Select Defect Data for Analysis
  - SP 1.2 Analyze Causes
- SG 2 Address Causes of Defects
  - SP 2.1 Implement the Action Proposals
  - SP 2.2 Evaluate the Effect of Changes
  - SP 2.3 Record Data

Configuration Management

- It is a support process area at Maturity Level 2.

Purpose

The purpose of **Configuration Management** *CM* is to establish and maintain the integrity of work products using configuration identification, configuration control, configuration status accounting, and configuration audits.

Specific Practices by Goal

- SG 1 Establish Baselines
  - SP 1.1 Identify Configuration Items
  - SP 1.2 Establish a Configuration Management System
  - SP 1.3 Create or Release Baselines
- SG 2 Track and Control Changes
  - SP 2.1 Track Change Requests
  - SP 2.2 Control Configuration Items
- SG 3 Establish Integrity
  - SP 3.1 Establish Configuration Management Records

- SP 3.2 Perform Configuration Audits

Decision Analysis and Resolution

- It is a support process area at Maturity Level 3.

Purpose

The purpose of **Decision Analysis and Resolution** *DAR* is to analyze possible decisions using a formal evaluation process that evaluates identified alternatives against established criteria.

Specific Practices by Goal

- SG 1 Evaluate Alternatives
  - SP 1.1 Establish Guidelines for Decision Analysis
  - SP 1.2 Establish Evaluation Criteria
  - SP 1.3 Identify Alternative Solutions
  - SP 1.4 Select Evaluation Methods
  - SP 1.5 Evaluate Alternatives
  - SP 1.6 Select Solutions

Integrated Project Management + IPPD

- It is a Project Management process area at Maturity Level 3.

Purpose

The purpose of **Integrated Project Management + IPPD** *IPM* is to establish and manage the project and the involvement of the relevant stakeholders according to an integrated and defined process that is tailored from the organization's set of standard processes.

Specific Practices by Goal

- SG 1 Use the Project's Defined Process
  - SP 1.1 Establish the Project's Defined Process
  - SP 1.2 Use Organizational Process Assets for Planning Project Activities
  - SP 1.3 Establish the Project's Work Environment
  - SP 1.4 Integrate Plans
  - SP 1.5 Manage the Project Using the Integrated Plans
  - SP 1.6 Contribute to the Organizational Process Assets
- SG 2 Coordinate and Collaborate with Relevant Stakeholders
  - SP 2.1 Manage Stakeholder Involvement
  - SP 2.2 Manage Dependencies
  - SP 2.3 Resolve Coordination Issues

IPPD Addition:

- SG 3 Apply IPPD Principles
  - SP 3.1 Establish the Project's Shared Vision
  - SP 3.2 Establish the Integrated Team Structure
  - SP 3.3 Allocate Requirements to Integrated Teams
  - SP 3.4 Establish Integrated Teams

- SP 3.5 Ensure Collaboration among Interfacing Teams

Measurement and Analysis

- It is a support process area at Maturity Level 2.

Purpose

The purpose of **Measurement and Analysis** *MA* is to develop and sustain a measurement capability that is used to support management information needs.

Specific Practices by Goal

- SG 1 Align Measurement and Analysis Activities
  - SP 1.1 Establish Measurement Objectives
  - SP 1.2 Specify Measures
  - SP 1.3 Specify Data Collection and Storage Procedures
  - SP 1.4 Specify Analysis Procedures
- SG 2 Provide Measurement Results
  - SP 2.1 Collect Measurement Data
  - SP 2.2 Analyze Measurement Data
  - SP 2.3 Store Data and Results
  - SP 2.4 Communicate Results

Organizational Innovation and Deployment

- It is a Process Management process area at Maturity Level 5.

Purpose

The purpose of **Organizational Innovation and Deployment** *OID* is to select and deploy incremental and innovative improvements that measurably improve the organization's processes and technologies. The improvements support the organization's quality and process-performance objectives as derived from the organization's business objectives.

Specific Practices by Goal

- SG 1 Select Improvements
  - SP 1.1 Collect and Analyze Improvement Proposals
  - SP 1.2 Identify and Analyze Innovations
  - SP 1.3 Pilot Improvements
  - SP 1.4 Select Improvements for Deployment
- SG 2 Deploy Improvements
  - SP 2.1 Plan the Deployment areas
  - SP 2.2 Manage the Deployment
  - SP 2.3 Measure Improvement Effects

Organizational Process Definition + IPPD

- It is a Process Management process area at Maturity Level 3.

Purpose

The purpose of **Organizational Process Definition + IPPD** *OPD* is to establish and maintain a usable set of organizational process assets.

Specific Practices by Goal

- SG 1 Establish Organizational Process Assets
  - SP 1.1 Establish Standard Processes
  - SP 1.2 Establish Life-Cycle Model Descriptions
  - SP 1.3 Establish Tailoring Criteria and Guidelines
  - SP 1.4 Establish the Organization's Measurement Repository
  - SP 1.5 Establish the Organization's Process Asset Library

IPPD Addition:

- SG 2 Enable IPPD Management
  - SP 2.1 Establish Empowerment Mechanisms
  - SP 2.2 Establish Rules and Guidelines for Integrated Teams
  - SP 2.3 Balance Team and Home Organization Responsibilities

Organizational Process Focus

- It is a Process Management process area at Maturity Level 3.

Purpose

The purpose of **Organizational Process Focus** *OPF* is to plan and implement organizational process improvement based on a thorough understanding of the current strengths and weaknesses of the organization's processes and process assets.

Specific Practices by Goal

- SG 1 Determine Process Improvement Opportunities
  - SP 1.1 Establish Organizational Process Needs
  - SP 1.2 Appraise the Organization's Processes
  - SP 1.3 Identify the Organization's Process Improvements
- SG 2 Plan and Implement Process Improvement Activities
  - SP 2.1 Establish Process Action Plans
  - SP 2.2 Implement Process Action Plans
- SG 3 Deploy Organizational Process Assets and Incorporate Lessons Learned
  - SP 3.1 Deploy Organizational Process Assets
  - SP 3.2 Deploy Standard Processes
  - SP 3.3 Monitor Implementation
  - SP 3.4 Incorporate Process-Related Experiences into the Organizational Process Assets

Organizational Process Performance

- It is a Process Management process area at Maturity Level 4.

Purpose

The purpose of **Organizational Process Performance** *OPP* is to establish and maintain a quantitative understanding of the performance of the organization's set of standard processes in support of quality and process-performance objectives, and to provide the process performance data, baselines, and models to quantitatively manage the organization's projects.

Specific Practices by Goal

- SG 1 Establish Performance Baselines and Models
  - SP 1.1 Select Processes
  - SP 1.2 Establish Process Performance Measures
  - SP 1.3 Establish Quality and Process Performance Objectives
  - SP 1.4 Establish Process Performance Baselines
  - SP 1.5 Establish Process Performance Models

Organizational Training

- It is a Process Management process area at Maturity Level 3.

Purpose

The purpose of **Organizational Training** OT is to develop the skills and knowledge of people so they can perform their roles effectively and efficiently.

Specific Practices by Goal

- SG 1 Establish an Organizational Training Capability
  - SP 1.1 Establish the Strategic Training Needs
  - SP 1.2 Determine Which Training Needs Are the Responsibility of the Organization
  - SP 1.3 Establish an Organizational Training Tactical Plan
  - SP 1.4 Establish Training Capability
- SG 2 Provide Necessary Training
  - SP 2.1 Deliver Training
  - SP 2.2 Establish Training Records
  - SP 2.3 Assess Training Effectiveness

Product Integration

- It is an Engineering process area at Maturity Level 3.

Purpose

The purpose of **Product Integration** PI is to assemble the product from the product components, ensure that the product, as integrated, functions properly, and deliver the product.

Specific Practices by Goal

- SG 1 Prepare for Product Integration
  - SP 1.1 Determine Integration Sequence
  - SP 1.2 Establish the Product Integration Environment
  - SP 1.3 Establish Product Integration Procedures and Criteria
- SG 2 Ensure Interface Compatibility
  - SP 2.1 Review Interface Descriptions for Completeness
  - SP 2.2 Manage Interfaces
- SG 3 Assemble Product Components and Deliver the Product
  - SP 3.1 Confirm Readiness of Product Components for Integration
  - SP 3.2 Assemble Product Components
  - SP 3.3 Evaluate Assembled Product Components

- SP 3.4 Package and Deliver the Product or Product Component

Project Monitoring and Control

- It is a Project Management process area at Maturity Level 2.

Purpose

The purpose of **Project Monitoring and Control** PMC is to provide an understanding of the project's progress so that appropriate corrective actions can be taken when the project's performance deviates significantly from the plan.

Specific Practices by Goal

- SG 1 Monitor Project Against Plan
  - SP 1.1 Monitor Project Planning Parameters
  - SP 1.2 Monitor Commitments
  - SP 1.3 Monitor Project Risks
  - SP 1.4 Monitor Data Management
  - SP 1.5 Monitor Stakeholder Involvement
  - SP 1.6 Conduct Progress Reviews
  - SP 1.7 Conduct Milestone Reviews
- SG 2 Manage Corrective Action to Closure
  - SP 2.1 Analyze Issues
  - SP 2.2 Take Corrective Action
  - SP 2.3 Manage Corrective Action

Project Planning

- It is a Project Management process area at Maturity Level 2.

Purpose

The purpose of **Project Planning** PP is to establish and maintain plans that define project activities.

Specific Practices by Goal

- SG 1 Establish Estimates
  - SP 1.1 Estimate the Scope of the Project
  - SP 1.2 Establish Estimates of Work Product and Task Attributes
  - SP 1.3 Define Project Life Cycle
  - SP 1.4 Determine Estimates of Effort and Cost
- SG 2 Develop a Project Plan
  - SP 2.1 Establish the Budget and Schedule
  - SP 2.2 Identify Project Risks
  - SP 2.3 Plan for Data Management
  - SP 2.4 Plan for Project Resources
  - SP 2.5 Plan for Needed Knowledge and Skills
  - SP 2.6 Plan Stakeholder Involvement
  - SP 2.7 Establish the Project Plan

- SG 3 Obtain Commitment to the Plan
    - SP 3.1 Review Plans that Affect the Project
    - SP 3.2 Reconcile Work and Resource Levels
    - SP 3.3 Obtain Plan Commitment

Process and Product Quality Assurance

- It is a support process area at Maturity Level 2.

Purpose

The purpose of **Process and Product Quality Assurance** $PPQA$ is to provide staff and management with objective insight into processes and associated work products.

Specific Practices by Goal

- SG 1 Objectively Evaluate Processes and Work Products
    - SP 1.1 Objectively Evaluate Processes
    - SP 1.2 Objectively Evaluate Work Products and Services
- SG 2 Provide Objective Insight
    - SP 2.1 Communicate and Ensure Resolution of Noncompliance Issues
    - SP 2.2 Establish Records

Quantitative Project Management

- It is a Project Management process area at Maturity Level 4.

Purpose

The purpose of the **Quantitative Project Management** QPM process area is to quantitatively manage the project's defined process to achieve the project's established quality and process-performance objectives.

Specific Practices by Goal

- SG 1 Quantitatively Manage the Project
    - SP 1.1 Establish the Project's Objectives
    - SP 1.2 Compose the Defined Processes
    - SP 1.3 Select the Sub-processes that Will Be Statistically Managed
    - SP 1.4 Manage Project Performance
- SG 2 Statistically Manage Sub-process Performance
    - SP 2.1 Select Measures and Analytic Techniques
    - SP 2.2 Apply Statistical Methods to Understand Variation
    - SP 2.3 Monitor Performance of the Selected Sub-processes
    - SP 2.4 Record Statistical Management Data

Requirements Development

- It is an Engineering process area at Maturity Level 3.

Purpose

The purpose of **Requirements Development** RD is to produce and analyze customer, product, and product-component requirements.

Specific Practices by Goal

- SG 1 Develop Customer Requirements
  - SP 1.1 Elicit Needs
  - SP 1.2 Develop the Customer Requirements
- SG 2 Develop Product Requirements
  - SP 2.1 Establish Product and Product-Component Requirements
  - SP 2.2 Allocate Product-Component Requirements
  - SP 2.3 Identify Interface Requirements
- SG 3 Analyze and Validate Requirements
  - SP 3.1 Establish Operational Concepts and Scenarios
  - SP 3.2 Establish a Definition of Required Functionality
  - SP 3.3 Analyze Requirements
  - SP 3.4 Analyze Requirements to Achieve Balance
  - SP 3.5 Validate Requirements

Requirements Management

- It is an Engineering process area at Maturity Level 2.

Purpose

The purpose of **Requirements Management** *REQM* is to manage the requirements of the project's products and product components and to identify inconsistencies between those requirements and the project's plans and work products.

Specific Practices by Goal

- SG 1 Manage Requirements
  - SP 1.1 Obtain an Understanding of Requirements
  - SP 1.2 Obtain Commitment to Requirements
  - SP 1.3 Manage Requirements Changes
  - SP 1.4 Maintain Bidirectional Traceability of Requirements
  - SP 1.5 Identify Inconsistencies between Project Work and Requirements

Risk Management

- It is a Project Management process area at Maturity Level 3.

Purpose

The purpose of **Risk Management** *RSKM* is to identify potential problems before they occur so that risk-handling activities can be planned and invoked as needed across the life of the product or project to mitigate adverse impacts on achieving objectives.

Specific Practices by Goal

- SG 1 Prepare for Risk Management
  - SP 1.1 Determine Risk Sources and Categories
  - SP 1.2 Define Risk Parameters
  - SP 1.3 Establish a Risk Management Strategy
- SG 2 Identify and Analyze Risks

    - SP 2.1 Identify Risks
    - SP 2.2 Evaluate, Categorize, and Prioritize Risks
- SG 3 Mitigate Risks
    - SP 3.1 Develop Risk Mitigation Plans
    - SP 3.2 Implement Risk Mitigation Plans

Supplier Agreement Management

- It is a Project Management process area at Maturity Level 2.

Purpose

The purpose of **Supplier Agreement Management** *SAM* is to manage the acquisition of products from suppliers for which there exists a formal agreement.

Specific Practices by Goal

- SG 1 Establish Supplier Agreements
    - SP 1.1 Determine Acquisition Type
    - SP 1.2 Select Suppliers
    - SP 1.3 Establish Supplier Agreements
- SG 2 Satisfy Supplier Agreements
    - SP 2.1 Execute the Supplier Agreement
    - SP 2.2 Monitor Selected Supplier Processes
    - SP 2.3 Evaluate Selected Supplier Work Products
    - SP 2.4 Accept the Acquired Product
    - SP 2.5 Transition Products

Technical Solution

- It is an Engineering process area at Maturity Level 3.

Purpose

The purpose of **Technical Solution** *TS* is to design, develop, and implement solutions to requirements. Solutions, designs, and implementations encompass products, product components, and product-related life-cycle processes either single or in combination as appropriate.

Specific Practices by Goal

- SG 1 Select Product-Component Solutions
    - SP 1.1 Develop Alternative Solutions and Selection Criteria
    - SP 1.2 Select Product Component Solutions
- SG 2 Develop the Design
    - SP 2.1 Design the Product or Product Component
    - SP 2.2 Establish a Technical Data Package
    - SP 2.3 Design Interfaces Using Criteria
    - SP 2.4 Perform Make, Buy, or Reuse Analysis
- SG 3 Implement the Product Design
    - SP 3.1 Implement the Design
    - SP 3.2 Develop Product Support Documentation

Validation

- It is an Engineering process area at Maturity Level 3.

Purpose

The purpose of **Validation** *VAL* is to demonstrate that a product or product component fulfills its intended use when placed in its intended environment.

Specific Practices by Goal

- SG 1 Prepare for Validation
    - SP 1.1 Select Products for Validation
    - SP 1.2 Establish the Validation Environment
    - SP 1.3 Establish Validation Procedures and Criteria
- SG 2 Validate Product or Product Components
    - SP 2.1 Perform Validation
    - SP 2.2 Analyze Validation Results.

Verification

- It is an Engineering process area at Maturity Level 3.

Purpose

The purpose of **Verification** *VER* is to ensure that selected work products meet their specified requirements.

Specific Practices by Goal

- SG 1 Prepare for Verification
    - SP 1.1 Select Work Products for Verification
    - SP 1.2 Establish the Verification Environment
    - SP 1.3 Establish Verification Procedures and Criteria
- SG 2 Perform Peer Reviews
    - SP 2.1 Prepare for Peer Reviews
    - SP 2.2 Conduct Peer Reviews
    - SP 2.3 Analyze Peer Review Data
- SG 3 Verify Selected Work Products
    - SP 3.1 Perform Verification
    - SP 3.2 Analyze Verification Results

Changes Made into Version 1.2

Only those changes that are made to the set of Process Areas are considered here. For a comprehensive detail, visit the SEI homepage.

- The following Process Areas have been removed *allonMaturityLevel3*:
    - Organizational Environment for Integration *OEI*
    - Integrated Teaming *IT*
    - Integrated Supplier Management *ISM*
- The following additions have been made within existing Process Areas:

- IPM . SG3 and SG4 were eliminated, new SG3 was added *allIPPDPAs*
- OPD . SG was added, turning it in an IPPD PA
- OPF . two SPs were extracted from SG and created SG3 together with two new SPs
- REQD . SP3.5 was renamed Validate Requirements
- SAM . SP2.1 was eliminated, two new SPs added in SG2
- TS . SP1.2 was eliminated
- VER . SP3.2 was renamed Analyze Verification Results

CMMI - APPRAISALS

The CMMI Appraisal is an examination of one or more processes by a trained team of professionals using an appraisal reference model as the basis for determining strengths and weaknesses of an organization.

Appraisals require planning. When planning an appraisal of your organization, determine the scope of the organizational unit, which disciplines to include, whether the appraisal team will consist of members internal or external to your organization, projects to be included, individuals to be interviewed, and the type or class of appraisal necessary.

Appraisals consider three categories of model components as defined in the CMMI:

- **Required** : specific and generic goals only.
- **Expected** : specific and generic practices only.
- **Informative** : includes sub-practices and typical work products.

The SEI has released two guiding documents for CMMI assessments:

- **Appraisal Requirements for CMMI** *ARC* : It contains the requirements for three classes of appraisal methods Class A, Class B, and Class C. These requirements are the rules for defining each class of appraisal method.
- **Standard CMMI Appraisal Method for Process Improvement** *SCAMPI* : Method Description Document *MDD* is currently the only approved Class A appraisal method.

SCAMPI is currently the only approved CMMI Class A Appraisal Method. That is, SCAMPI satisfies all the requirements of an ARC Class A Appraisal Method and has been approved by the SEI.

There are three classes of CMMI Appraisal Methods: Class A, Class B, and Class C.

SCAMPI Class A Appraisal

A SCAMPI Class A appraisal is typically conducted when an organization has implemented a number of significant process improvements and needs to formally benchmark its process relative to the CMMI. A SCAMPI A is the only appraisal method that provides CMMI Maturity Level or Capability Level ratings.

You can expect following outcomes from a SCAMPI A:

- A Maturity Level rating or Capability Level ratings.
- Findings that describe the strengths and weaknesses of your organization's process relative to the CMMI.
- Consensus regarding the organization's key process issues.
- An appraisal database that the organization can continue to use, to monitor process improvement progress and to support future appraisals.

SCAMPI Class B Appraisal

A SCAMPI B is called for when an organization needs to assess its progress towards a target CMMI Maturity Level, but at a lower cost than a SCAMPI A. SCAMPI B appraisals provide detailed findings and indicate the likelihood that the evaluated practices would be rated as satisfactorily implemented in a SCAMPI A appraisal.

A SCAMPI Class B appraisal, one of three SEI appraisal methods, helps an organization understand, with a relatively high degree of confidence, the status of its software and systems engineering process relative to the CMMI. A SCAMPI B is often performed when an organization needs to accurately assess its progress towards a target CMMI Maturity Level.

You can expect following outcomes from a SCAMPI B:

- Detailed findings that describe the strengths and weaknesses of your organization's process relative to the CMMI.
- Practice characterizations indicating the likelihood that the examined practices would satisfy the goals and meet the intent of the CMMI.
- Consensus regarding the organization's key process issues.
- A FIDO database that the organization can continue to use, to monitor process improvement progress and to support future appraisals.

SCAMPI Class C Appraisal

SCAMPI C appraisals are shorter and more flexible than SCAMPI A and B appraisals and are conducted to address a variety of special needs, from a quick gap analysis to determining an organization's readiness for a SCAMPI A.

SCAMPI Class C appraisals, the least formal of the SEI's suite of appraisal methods, are highly flexible and can be conducted to address a variety of needs. Typically much shorter in duration than Class A and B appraisals, SCAMPI C appraisals are often performed for reasons such as:

- Provide a quick gap analysis of an organization's process relative to the CMMI.
- Assess the adequacy of a new process before it is implemented.
- Monitor the implementation of a process.
- Determine an organization's readiness for a SCAMPI A.
- Support the selection of a supplier.

You can expect following outcomes from a SCAMPI C:

- Findings that describe the strengths and weaknesses of the assessed processes. Depending on the appraisal scope and strategy, findings may be mapped to the relevant CMMI components.
- Characterizations that summarize the adequacy of the assessed processes vis-a-vis the CMMI.
- Recommended process improvement actions.
- A FIDO database that the organization can continue to use to monitor process improvement progress and to support future appraisals.

Appraisal Class Characteristics

Each class is distinguished by the degree of rigor associated with the application of the method. Class A is the most rigorous, Class B is slightly less rigorous, and Class C is the least rigorous. Following table gives some idea of the expected differences between the methods in each class.

Characteristics	Class A	Class B	Class C
Amount of objective evidence gathered	High	Medium	Low

Rating generated	Yes	No	No
Resource needs	High	Medium	Low
Team size	Large	Medium	Small
Data sources *instruments, interviews, anddocuments*	Requires all three data sources	Requires only two data sources *onemustbeinterviews*	Requires only one data source
Appraisal team leader requirement	Authorized Lead Appraiser	Authorized Lead Appraiser or person trained and experienced	Person trained and experienced

SCAMPI Fundamentals

SCAMPI is an acronym that stands for Standard CMMI Appraisal Method for Process Improvement. A SCAMPI assessment must be led by an SEI authorized SCAMPI Lead Appraiser. SCAMPI is supported by the SCAMPI Product Suite, which includes the SCAMPI Method Description, maturity questionnaire, work aids, and templates.

Currently, SCAMPI is the only method that can provide a rating, the only method recognized by the SEI, and the method of most interest to organizations.

SCAMPI is based on experience from previous methods, including:

- **CBA IPI** : CMM-Based Appraisal for Internal Process Improvement.
- **SCE** : Software Capability Evaluation.
- **EIA/IS 732.2** : The interim international standard entitled Systems Engineering Assessment Method.
- **SDCE** : Software Development Capability Evaluation.
- FAA Appraisal Method.

CMMI PLAYERS - ROLES RESPONSIBILITIES

This chapter discusses the major players involved with a process improvement effort. However, your organization may require more or fewer groups.

Note that one person can fulfill many of these roles simultaneously or serially, depending on the size of your organization and the complexity of your process improvement *PI* effort.

Process Improvement

Process improvement efforts generally require the following individuals and groups:

- **PI Sponsor** : The person from the organization responsible for over-seeing the entire PI effort. This person generally has the power to allocate funds and personnel. This person is usually at the directorate level or above.
- **PI Champion** : This is the public relations person for the PI effort, who may or may not serve as the EPG Lead. This person markets the idea, approach, and results of PI.
- **Engineering Process Group *EPG* Lead** : This person leads the group that reviews processes. This person assigns tasks to the EPG members, monitors their efforts, and plans the daily duties of the EPG.
- **EPG Members** : These individuals serve on the EPG as committee members. They are responsible for ensuring that process improvement documentation is written and followed. They are also responsible for generating metrics to track the process improvement process. They lead the PATs.

- **Process Action Teams** *PATs* : These teams generate the process improvement documentation, policies, processes, procedures, charters, and Action Plans.
- **Transition Partner** : Usually one or two individuals who are outside consultants brought in to help set up, plan, lead, and monitor progress in organizational process improvement. These individuals bring experience doing process improvement from several other organizations and industries.

CMMI - SUMMARY

This tutorial covered the Structure of CMMI that consists of the following components:

- Maturity Levels *stagedrepresentation* or Capability Levels *continuousrepresentation*
- Process Areas
- Goals: Generic and Specific
- Common Features
- Practices: Generic and Specific

We have covered all the maturity levels and capability levels. In addition, we discussed all the Key Process Areas and related Generic Goals, Specific Goals, Common Features and Practices.

Later, we have given you a brief introduction on CMMI Appraisals and showed you the different Appraisal Classes.

What is Next?

SEI CMMI is a big subject that cannot be explained in a small tutorial. So we strongly recommend you to go through other CMMI resources and collect more information on this subject. These resources are listed in the CMMI Resources chapter.

Please send me your feedback at *webmaster@tutorialspoint.com*