NANYANG TECHNOLOGICAL UNIVERSITY
SINGAPORE

CMMI 1.3 Maturity Level 2 Definition for QMePls

By Team Titans

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Revision History

Name	Date	Changes	Version
Jolene	14/10/2021	Uploaded Initial Template	1.0
Jolene	17/10/2021	Executive Summary Description Level 2 KPAs	1.1
Jolene	21/10/2021	Generic goals and practices Specific goals and practices	1.2
Jolene	23/10/2021	CMMI audit checklist CMMI interview affirmation questions	1.3
Jolene, Aloysius	25/10/2021	Approvals	1.4
Qian Yi	27/10/2021	Format Document	1.5

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1. Executive summary

1.1 Purpose

Capability Maturity Model Integration (CMMI) process model provides a clear definition of what team members should follow in order to achieve effective processes throughout the project lifecycle. Various areas such as practices, goals, areas and models need to be defined cohesively for the CMMI process model to work effectively.

1.2 Summary of Definition

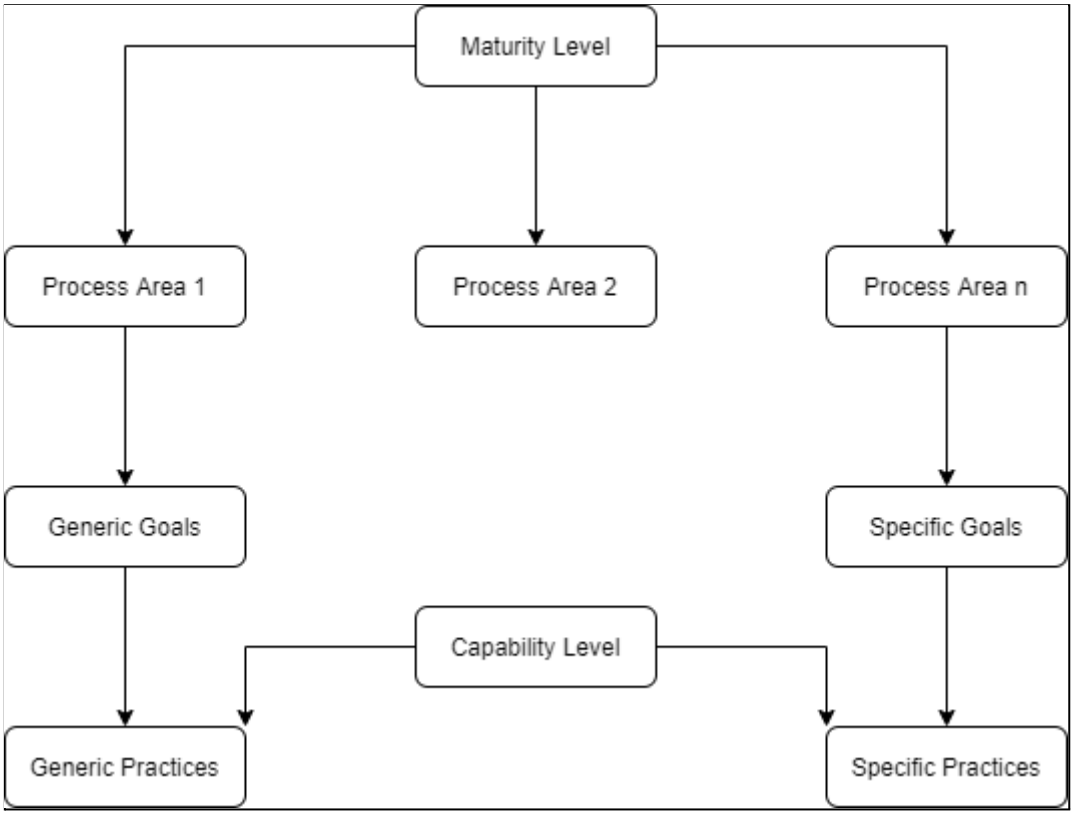

Fig 1: CMMI Level 2 Model

The following Key Process Areas (KPAs) are the requirements for CMMI Level 2

- Requirements Management
- Project Planning
- Project Monitoring and Control
- Process and Product Quality Assurance
- Configuration Management
- Measurement and Analysis
- Supplier Agreement Management

Common Features
The following common features in CMMI are used to ensure the KPAs are managed, planned, performed, measured and controlled.

- Commitment to Perform
- Ability to perform
- Activities Performed
- Measurement and Analysis
- Verifying Implementation

2. Description

As specific and generic goals of maturity level 2 process areas are achieved when the team is at maturity level 2, the team is capable of ensuring that all requirements and processes are managed, planned, performed, measured and controlled.

Process discipline defined by maturity level 2 ensures that all practices will continue to be executed smoothly in times of stress, and projects are performed and managed according to the documented plans. Status of products and delivery will also remain accessible to management at defined milestones of the project.

Work products are reviewed with its relevant stakeholders and are recorded. Commitments are established among relevant stakeholders and revised when necessary. This ensures that the work product satisfies the stakeholders' defined requirements, standards and objectives.

3. Level 2 KPAs

The following section lists and explains each of the Key Process Areas of CMMI1.3 level 2.

3.1 Requirement Management (REQM)

The purpose of the Requirement Management is to manage requirements of the project's products and product components and to ensure alignment between the customer requirements and the project's plans and work products.

3.2 Project Planning (PP)

The purpose of Project Planning is to establish reasonable plans for performing software engineering and managing the software project, developing realistic estimates for the work and establishing necessary commitments to perform the work. It begins with Statement of Work and constraints and goals that define and bound the project.

3.3 Project Monitoring and Control (PMC)

The purpose of Project Monitoring and Control 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.

3.4 Process and Product Quality Assurance (PPQA)

The purpose of Process and Product Quality Assurance is to provide staff and management with objective insight into processes and associated work products. It objectively evaluates performed processes and work products against applicable process descriptions, standards and procedures. PPQA helps identify and documents any noncompliance issues and ensures that they are addressed.

3.5 Configuration Management (CM)

The purpose of Configuration Management is to establish and maintain the integrity of the software project product throughout the project's software life cycle. It will identify the configuration of the software at given points in time, systematically controlling changes to the configuration, maintaining integrity and traceability in the configuration throughout the software lifecycle.

3.6 Measurement and Analysis (MA)

The purpose of Measurement and Analysis is to develop and sustain a measurement capability used to support management information needs in implementing monitoring and control of various required processes.

3.7 Supplier Agreement Management (SAM)

The purpose of Supplier Agreement Management is to manage the acquisition of products and services from suppliers, product and service components that can be delivered to the project's stakeholder.

4. Generic Goals and Practices

Generic goals describe the characteristics that must be present to institutionalize processes that implement a process area. Generic goal is a required model component to determine whether a process area is satisfied.

The following section defines and explains your possible generic practices for each of the common features.

4.1 Commitment to Perform

Practices:

- Establish and maintain organizational-wide policy for planning and performing the process.

4.2 Ability to Perform

Practices:

- Establish and maintain the plan for performing the process
- Provide adequate resources for performing the process, developing the work products, and providing the services of the process
- Obtaining and installing tools which is required to do the job.
- Assign responsibility and authority for performing the process, developing the work products, and providing the services of the process
- Train the people performing or supporting the process to be more efficient as needed
- Structure the organization to perform more effectively.
- Establish and maintain the description of a defined process

4.3 Activities to Perform

Practices:

- Place selected work products of the process under appropriate levels of control
- Identify and involve the relevant stakeholders of the process as planned

4.4 Measurements

Practices:

- Put plans and procedures in place to ensure all the relevant work is done on time
- Monitor and control the process against the plan for performing the process and take appropriate corrective action
- Collect process related experiences derived from planning and performing the process to support the future use and improvement of the organisation’s processes and process assets

4.5 Verify

Practices:

- Objectively evaluate adherence of the process and selected work products against the process description, standards and procedures address in the software quality assurance plan and address noncompliance
- Review the activities, status and results of the process with higher level management and resolve issues

5. Specific Goals and Practices

Specific goals and practice is an informative component. A specific practice is the description of an activity that is considered important in achieving the associated specific goal. The specific practices describe the activities that are expected to result in achievement of specific goals of the process area.

The section defines our specific goals and corresponding key practices for each key process area identified and explained in the section of “Level 2 KPAs”.

5.1 Requirement Management (REQM)

Goal:

- To establish common understanding between customer and project personnel on the customer’s requirements.

Practices:

- Perform requirement elicitation by interviewing the customer
- Build a prototype to make all requirements to be tangible to the customer

5.2 Project Planning (PP)

Goal(1):

- Estimate a reasonable scope of the project

Practices(1):

- Develop a work breakdown structure (WBS)
- Define work packages in sufficient detail so that estimates of project tasks, responsibilities, and schedule can be specified
- Identify products and product components to be externally acquired or reused (resource requirements)

Goal(2):

- Establish a reasonable project time and budget

Practices(2):

- Identify major milestones
- Identify constraints (task duration, resources, inputs and outputs)
- Identify task dependencies (precedence relationships and sequence activities)
- Determine estimates for effort allocation

5.3 Project Monitoring and Control (PMC)

Goal(1):

- Monitor actual values of project planning parameters against the project plan

Practices(1):

- Monitor progress against the schedule
- Monitor the attributes of work products and tasks
- Document significant deviations in project planning parameter

Goal(2):

- Monitor risks against those identified in the project plan

Practices(2):

- Periodically review the documentation of risks in the context of the project's current status and circumstances
- Revise the documentation of risks as additional information becomes available
- Communicate risk status to relevant stakeholders

5.4 Process and Product Quality Assurance (PPQA)

Goal:

- Objectively evaluate selected work product against applicable process descriptions, standards and procedures

Practices:

- Promote an environment that encourages identifying and reporting quality issues
- Establish and maintain clearly stated criteria for evaluations
- Evaluate selected work products at selected time (before/during delivery, during integration, during unit testing)
- Identify each cases of noncompliance found during the evaluation

5.5 Configuration Management (CM)

Goal(1):
- Establish baselines for internal use and for delivery to the stakeholders

Practice(1):
- Identify and document configuration items in baseline
- Obtain authorisation from the change control board before creating or releasing baselines of configurations
- Create or release baselines only from configuration items in the configuration management
- Make the current baseline readily available

Goal(2):
- Track change requests for configuration items

Practices(2):
- Initiate record change request
- Analyse the impact of changes and fixes proposed in change request
- Categorise and prioritise change requests
- Review change request to be addressed in the next baseline with relevant stakeholders and get approval
- Track the status of change requests to closure

Goal(3):
- Establish and maintain integrity of baselines

Practices(3):
- Use configuration audit to ensure conformance of required functional and physical characteristics
- Use configuration control to manage changes

5.6 Measurement and Analysis (MA)

Goal(1):
- Establish and maintain measurement objectives derived from identified information needs and objectives

Practices(1):
- Document information needs and objectives
- Prioritise information needs and objectives
- Document, review and update measurement objectives
- Maintain traceability of measurement objectives to identify information needs and objectives

Goal(2):
- Specify measures to address measurement objectives

Practices(2):
- Identify measures based on documented measurement objectives
- Specify operation definitions for measurement
- Prioritise, review and update measurement
- Obtain data for base measurement
- Generate data for derived measurement

5.7 Supplier Agreement Management (SAM)

Goal:

- Select suppliers based on an evaluation of their ability to meet the specified requirements and established criteria

Practices:

- Establish and document criteria for evaluating potential suppliers
- Identify potential suppliers and distribute solicitation material and requirements to them
- Evaluate proposal according to evaluation criteria
- Evaluate risks associated with each proposed supplier
- Evaluate proposed supplier’s abilities to perform the work

6. Approvals

Role	Personnel	Status
Project Manager	Jolene Tan	Approved
Quality Assurance Manager	Aloysius Seow	Approved

7. CMMI Audit Checklist

Level	Process Area	Specific Goal	Specific Practice	Total
2 - Managed	Requirement Management (REQM)	Establish common understanding between customer and project personnel	Perform requirement elicitation by interviewing the customer	100%
			Build a prototype	100%
	Project Planning (PP)	Estimate a reasonable scope	Develop a work breakdown structure	100%
			Define work packages in sufficient detail	100%
			Identify products and product components to be externally acquired or reused	100%
		Establish a reasonable project time and budget	Identify major milestones	100%
			Identify constraints	100%
			Identify task dependencies	100%
			Determine estimates for effort allocation	100%
	Project Monitoring and Control (PMC)	Monitor actual values of project planning parameters	Monitor progress against the schedule	100%
			Monitor the attributes of work products and tasks	100%
			Document significant deviations	100%
		Monitor risks against those identified	Periodically review the documentation of risks	100%
			Revise the documentation of risks	100%
			Communicate risk status	100%
	Process and Product Quality Assurance (PPQA)	Objectively evaluate selected work product	encourages identifying and reporting quality issues	100%
			Establish and maintain clearly stated criteria for evaluations	100%
			Evaluate selected work products at selected time	100%
			Identify each cases of noncompliance	100%
	Configuration Management (CM)	Establish baselines	Identify and document configuration items	100%
			Obtain authorisation from the change control board	100%
			Create or release baselines	100%
			Make the current baseline readily available	100%
		Track change requests	Initiate record change request	100%
			Analyse the impact	100%
			Categorise and prioritise change requests	100%
			Review change request	100%

			Track the status of change requests	100%
		Establish and maintain integrity of baselines	Ensure conformance of required functional and physical characteristics	100%
			Use configuration control to manage changes	100%
	Measurement and Analysis (MA)	Establish and maintain measurement objectives	Document information	100%
			Prioritise information	100%
			Document, review and update measurement objectives	100%
			Maintain traceability of measurement objectives	100%
		Specific measures to address measurement objectives	Identify measures	100%
			Specify operation definitions	100%
			Prioritise, review and update measurement	100%
			Obtain data for base measurement	100%
			Generate data for derived measurement	100%
	Supplier Agreement Management (SAM)	Select suppliers based on an evaluation	Establish and document criteria	100%
			Identify potential suppliers and distribute solicitation material and requirements	100%
			Evaluate proposal	100%
			Evaluate risks	100%
			Evaluate proposed supplier’s abilities	100%

8. CMMI Interview Affirmation Questions

The following are the interview questions used to help define CMMI1.3 Level 2.

- What is Level 2 Managed?

  Level 2 Managed: An organisation has fulfilled all specific and generic goals of level 2 process areas. It has been proven that requirements are managed and that processes are controlled, planned and monitored.

- Explain the different Process Area in CMMI

  The following are the different process areas in CMMI:

  1. Initial process: This process involves in software configuration management, software quality assurance, software subcontract management, software project tracking and oversight, software project planning and requirements management
  2. Defined process: This process involved in peer reviews, intergroup coordination, software product engineering, integrated software management, training program, organisation process definition, organisation process focus
  3. Managed process: This process involves in software quality management, quantitative process management
  4. Optimising process: Process change management, technology change management, and defect prevention

- Explain what the SCAMPI process is

  SCAMPI stands for standard CMMI appraisal method for process improvement. Benchmark quality ratings are provided by it which is relative to CMMI models. Wide range of appraisal usage models are utilised by applying SCAMPI process including internal process improvement and external capability determinations. All of the Appraisal Requirements for CMMI requirements for a class A appraisal method is satisfied by SCAMPI and it supports the assessment conduct of ISO/IEC 15504