

Chapter 5 CMMI Self-Appraisal

Table 22 shows the characteristics of CMMI appraisal method classes (Class A, Class B, and Class C). The key differentiating attributes for appraisal classes include the degree of confidence in the appraisal outcomes, the generation of ratings, and appraisal cost and duration (CMU/SEI, 2001a).

Table 22 Characteristics of CMMI Appraisal Method Classes

Characteristics	Class A	Class B	Class C
Amount of Objective Evidence Gathered (relative)	High	Medium	Low
Ratings Generated	Yes	No	No
Resource Needs (relative)	High	Medium	Low
Team Size (relative)	Large	Medium	Small
Appraisal Team Leader Requirements	Lead appraiser	Lead appraiser or person trained and experienced	Person trained and experienced

Source: CMU/SEI, *Appraisal Requirements for CMMISM*, Version 1.1(ARC, V1.1), 2001a.

We use the Class C CMMI appraisal method to simply review the evidences from the illustrations of IREQM framework and the corresponding *AutoREQM* implementation. Table 23 and 24 shows the CMMI self-appraisal checklists. The purposes of this categorization of checklist is to provide the tool for organizations to appraise its organizational maturity and process area capability, along with the differentiation between their existing process and CMMI model (Gap Analysis).

The data sources essential to SCAMPI (CMU/SEI, 2001b), a formal appraisal method, include questionnaire, documentation, and interview. Although the appraisal checklist can serve as a form of questionnaire, interview has to be included as another important consideration for organization during a formal CMMI appraisal. Thus, even if the framework features via this checklist are all fully implemented and appropriate documents are collected from the supporting system, it is not enough for the organization to pass the formal CMMI appraisal without interview.

For those disposed to meet the goals and practices of REQM and RD in CMMI, these checklists provide the basis to assess the extent of what accomplished by our IREQM framework.

Table 23 Appraisal Checklist for Supporting REQM Process Area in CMMI Level 2

Goal	Practice	Check#	Check Item	Direct Results	Indirect Results
SG1	SP 1.1	rmisp1.1.1	Establish criteria for distinguishing appropriate requirements providers.		RD(Who) in Table11
		rmisp1.1.2	Establish objective criteria for the acceptance of requirements.		RMP
		rmisp1.1.3	Analyze requirements to ensure that the established criteria are met.		RMP,RD
		rmisp1.1.4	Reach an understanding of the requirements with the requirements provider so the project participants can commit to them		RD(joint meeting) , Table11
	SP 1.2	rmisp1.2.1	Assess the impact of requirements on existing commitments.	Screen16	RCM(Figure 8, Table 12)
		rmisp1.2.2	Negotiate and record commitments.	Screen19	RCM(Figure 8, Table 12)
	SP 1.3	rmisp1.3.1	Capture all requirements and requirements changes that are given to or generated by the project	Screen7,20	RD
		rmisp1.3.2	Maintain the requirements change history with the rationale for the changes.	Screen20	RCM
		rmisp1.3.3	Evaluate the impact of requirement changes from the standpoint of relevant stakeholders.	Screen16	RCM
		rmisp1.3.4	Make the requirements and change data available to the project.	Screen 20	RCM,RD
	SP 1.4	rmisp1.4.1	Maintain requirements traceability to ensure that the source of lower level (derived) requirements is documented.	Screen5,6	RCM,RD
		rmisp1.4.2	Maintain requirements traceability from a requirement to its derived requirements as well as to its allocation of functions, objects, people, processes, and work products.	Screen5,6	RCM,RD
		rmisp1.4.3	Maintain horizontal traceability from function to function and across interfaces.	Screen5	RCM,RD
		rmisp1.4.4	Generate the requirements traceability matrix.	Screen5	RCM,RD
	SP 1.5	rmisp1.5.1	Review the project's plans, activities, and work products for consistency with the requirements and the changes made to them.	Screen17	RCM

		rmsp1.5.2	Identify the source of the inconsistency and the rationale.	Screen17	RCM
		rmsp1.5.3	Identify changes that need to be made to the plans and work products resulting from changes to the requirements baseline.	Screen12	Associating the requirements managed in RPro with requirements change request
		rmsp1.5.4	Initiate corrective actions.	Screen17	
GG2	GP2.1	Establish and maintain an organizational policy for planning and performing the requirements management process.		Organizational policy in REQM is established.	Figure6~8, Table10~12
	GP2.2	Establish and maintain the plan for performing the requirements management process.		RMP	
	GP2.3	Provide adequate resources for performing the requirements management process, developing the work products, and providing the services of the process.		REQM personnel, RPro, CQ, Documents within IREQM	
	GP2.4	Assign responsibility and authority for performing the process, developing the work products, and providing the services of the requirements management process.		Table17	Table11,12(who) , Screen1
	GP2.5	Train the people performing or supporting the requirements management process as needed.		IREQM provides the REQM materials for organization to train people	Figure6~8, Table10~12
	GP2.6	Place designated work products of the requirements management process under appropriate levels of configuration management.		Screen 5 (Traceability Matrix)	Table12
	GP2.7	Identify and involve the relevant stakeholders of the requirements management process as planned.		Table17	Table11,12(who)
	GP2.8	Monitor and control the requirements management process against the plan for performing the process and take appropriate corrective action.		Screen20 (Using statistic information for measures used in monitoring and controlling)	Figure6~8, Table10~12
	GP2.9	Objectively evaluate adherence of the requirements management process against its process description, standards, and procedures, and address noncompliance.		Periodically evaluate and review the adherence of IREQM framework guidelines.	Figure6~8, Table10~12(What/Artifacts, How/Activities)
	GP2.10	Review the activities, status, and results of the requirements management process with higher level management and resolve issues		<i>AutoREQM</i> provides a convenient tool for higher level management involvement of REQM.	Figure6~8, Table10~12

Source: revised from Information System Laboratory, Institute for Information Industry, 2002

Table 24 Appraisal Checklist for Supporting RD Process Area in CMMI Level 3

Goal	Practice	Check#	Check Items	Direct Results	Indirect Results
SG 1	SP 1.1	rdsp1.1.1	Engage relevant stakeholders using methods for eliciting needs, expectations, constraints, and external interfaces.		Table11, Understand Stakeholder Needs and Elicit Stakeholder Requests
		rdsp1.2.1	Translate the stakeholder needs, expectations, constraints, and interfaces into documented customer requirements.	Vision	
	rdsp1.2.2	Define constraints for verification and validation.			
SG 2	SP 2.1	rdsp2.1.1	Develop requirements in technical terms necessary for product and product-component design.	Use Case Model	Table11
		rdsp2.1.2	Derive requirements that result from design decisions.		
		rdsp2.1.3	Establish and maintain relationships between requirements for consideration during change management and requirements allocation.	Screen7	Table11, Manage dependencies (traceability)
	SP 2.2	rdsp2.2.1	Allocate requirements to functions.	Screen5	Table11, Analyze Functions
		rdsp2.2.2	Allocate requirements to product components.		
		rdsp2.2.3	Allocate design constraints to product components.		
		rdsp2.2.4	Document relationships among allocated requirements.	Screen7	
	SP2.3	rdsp2.3.1	Identify interfaces both external to the product and internal to the product (i.e., between functional partitions or objects).		
		rdsp2.3.2	Develop the requirements for the identified interfaces.		
	SG 3	SP 3.1	rdsp3.1.1	Develop operational concepts and scenarios that include functionality, performance, maintenance, support, and disposal as appropriate.	Figure13~15
rdsp3.1.2			Define the environment the product will operate in, including boundaries and constraints.	Vision	Table11, Stakeholder Description
rdsp3.1.3			Review operational concepts and scenarios to		Table11, Analyze Operational

			refine and discover requirements.		Workflow
		rdsp3.1.4	Develop a detailed operational concept, as products and product components are selected, that defines the interaction of the product, the end user, and the environment, and that satisfies the operational, maintenance, support, and disposal needs.	Figure13~15	Figure7
	SP 3.2	rdsp3.2.1	Analyze and quantify functionality required by end users.	Table18,19	Table11, Analyze Functions, Find Use cases
		rdsp3.2.2	Analyze requirements to identify logical or functional partitions (e.g., subfunctions).	Use Case Description(flow of events)	Table11, Detail Use Case
		rdsp3.2.3	Partition requirements into groups, based on established criteria (e.g., similar functionality, performance, or coupling), to facilitate and focus the requirements analysis.	Use Case Packages	Figure12, Requirements are divided into RD, RCM and Management Support.
		rdsp3.2.4	Consider the sequencing of time-critical functions both initially and subsequently during product-component development.	Table19	Table11, Prioritize Use Case
		rdsp3.2.5	Allocate customer requirements to functional partitions, objects, people, or support elements to support the synthesis of solutions.	Table18,19	
		rdsp3.2.6	Allocate functional and performance requirements to functions and subfunctions.	Use Case Description(flow of events)	Table11, Analyze Supplementary Specification
	SP 3.3	rdsp3.3.1	Analyze stakeholder needs, expectations, constraints, and external interfaces to remove conflicts and to organize into related subjects.	Joint meeting in RD process	Table11
		rdsp3.3.2	Analyze requirements to determine whether they satisfy the objectives of higher level requirements.	Table18,19	Table11
		rdsp3.3.3	Analyze requirements to ensure that they are complete, feasible, realizable, and verifiable.		
		rdsp3.3.4	Identify key requirements that have a strong	Screen7, Table19	Table11

			influence on cost, schedule, functionality, risk, or performance.		
		rdsp3.3.5	Identify technical performance measures that will be tracked during the development effort.		
		rdsp3.3.6	Analyze operational concepts and scenarios to refine the customer needs, constraints, and interfaces and to discover new requirements.	Figure9,10,11	Table11, Analyze Operational Workflow
	SP 3.4	rdsp3.4.1	Use proven models, simulations, and prototyping to analyze the balance of stakeholder needs and constraints.	<i>AutoREQM</i>	
		rdsp3.4.2	Perform a risk assessment on the requirements and functional architecture.	Screen9	
		rdsp3.4.3	Examine product life-cycle concepts for impacts of requirements on risks.	Screen5	
	SP3.5	rdsp3.5.1	Analyze the requirements to determine the risk that the resulting product will not perform appropriately in its intended-use environment.		
		rdsp3.5.2	Explore the adequacy and completeness of requirements by developing product representations (e.g., prototypes, simulations, models, scenarios, and storyboards) and by obtaining feedback about them from relevant stakeholders.	<i>AutoREQM</i> prototype system	
		rdsp3.5.3	Assess the design as it matures in the context of the requirements validation environment to identify validation issues and expose unstated needs and customer requirements.		
GG3	GP2.1	Establish and maintain an organizational policy for planning and performing the requirements development process.		Organizational policy in RD is established.	Using RD process(Figure7)
	GP3.1	Establish and maintain the description of a defined requirements development process.		Figure7(RD in IREQM framework)	
	GP2.2	Establish and maintain the plan for performing the requirements development process.		RMP	Figure6~7, Table10~11

GP2.3	Provide adequate resources for performing the requirements development process, developing the work products, and providing the services of the process.	REQM personnel, RPro, CQ, Documents within IREQM	Figure6,7, Table10,11
GP2.4	Assign responsibility and authority for performing the process, developing the work products, and providing the services of the requirements development process.	Table17	Table11 (Who)
GP2.5	Train the people performing or supporting the requirements development process as needed.	RD provides the RD materials for organization to train people	Figure6,7, Table10,11
GP2.6	Place designated work products of the requirements development process under appropriate levels of configuration management.	Screen 5 (Traceability Matrix)	Table11
GP2.7	Identify and involve the relevant stakeholders of the requirements development process as planned.	Table17	Table11 (who)
GP2.8	Monitor and control the requirements development process against the plan for performing the process and take appropriate corrective action.	Screen20 (Using statistic information for measures used in monitoring and controlling)	Figure6,7, Table10,11
GP3.2	Collect work products, measures, measurement results, and improvement information derived from planning and performing the requirements development process to support the future use and improvement of the organization's processes and process assets.	With measure and analysis process, people performing RD should collect work products, measures, measurement results, and improvement information derived from planning	Figure6,7 Table10,11
GP2.9	Objectively evaluate adherence of the requirements development process against its process description, standards, and procedures, and address noncompliance.	Periodically evaluate and review the adherence of RD guidelines.	Figure6, 7 Table10,11(What /Artifacts, How/Activities)
GP2.10	Review the activities, status, and results of the requirements development process with higher level management and resolve issues.	<i>AutoREQM</i> provides a convenient tool for higher level management involvement of RD.	Figure6,7 Table10,11

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