



CMMI Implementation

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What is CMMI

- **CMMI or Capability Maturity Model Integration is a process improvement model developed by the Software Engineering Institute, Carnegie Mellon University.**
- **CMMI was developed from the SW-CMM which was used widely by software organizations throughout the world.**
- **Additional disciplines are included in CMMI.**
- **Software Park introduced SW CMM to Thai SW industry in 1999 and transit to CMMI about three years ago.**
- **Now SIPA has set a target to have at least 20 companies appraised in the next two years.**



CMMI can be used for:

- Software Engineering Discipline
- System Engineering Discipline
- Integrated Product and Process Development Discipline
- Supplier Sourcing Discipline

- And

- Other disciplines if appropriately implemented




CMMI Consists of Process Areas

- A Process Area is a cluster of related practices in an area that, when implemented collectively, satisfies a set of goals considered important for making significant improvement in that area.
- There are 25 Process Areas in CMMI
- Examples of process areas
 - Project Planning
 - Configuration Management
 - Risk Management
- These PA's are organized in two ways

Continuous Representation: PAs by Categories

Category	Process Areas
Process Management	Organizational Process Focus Organizational Process Definition Organizational Training Organizational Process Performance Organizational Innovation and Deployment
Project Management	Project Planning Project Monitoring and Control Supplier Agreement Management Integrated Project Management for IPPD Risk Management Integrated Teaming Integrated Supplier Management Quantitative Project Management
Engineering	Requirements Management Requirements Development Technical Solution Product Integration Verification Validation
Support	Configuration Management Process and Product Quality Assurance Measurement and Analysis Decision Analysis and Resolution Organizational Environment for Integration Causal Analysis and Resolution

Staged Representation: PAs by Maturity Level

Level	Focus	Process Areas	Quality Productivity
5 Optimizing	<i>Continuous Process Improvement</i>	Organizational Innovation and Deployment Causal Analysis and Resolution	
4 Quantitatively Managed	<i>Quantitative Management</i>	Organizational Process Performance Quantitative Project Management	
3 Defined	<i>Process Standardization</i>	Requirements Development Technical Solution Product Integration Verification Validation Organizational Process Focus Organizational Process Definition Organizational Training Integrated Project Management for IPPD Risk Management Integrated Teaming Integrated Supplier Management Decision Analysis and Resolution Organizational Environment for Integration	
2 Managed	<i>Basic Project Management</i>	Requirements Management Project Planning Project Monitoring and Control Supplier Agreement Management Measurement and Analysis Process and Product Quality Assurance Configuration Management	
1 Initial			
			Risk Rework



Two Kinds of Practices

- Practices are activities that must be performed in each process area.
- There are two kinds of practices:
- **Specific Practices:** Description of an activity considered important to achieve the associated specific goal of the process area. Specific Practices are the essence of the PA and are different for each PA.
- **Generic Practices:** Description of an activity considered important to achieve the associated generic goal. Generic practices strengthen the institutionalization of the PA. Same Generic practices appear in all PA.



Analogy with learning

- When we study for a degree we need to take several courses
- We can imagine each course as a Process Area
- The specific goal of learning a course is to pass the exam with good grade, e.g., not less than C. Specific practices in learning are: attending the classes, work on exercises, sit in midterm exam, submit the project work and sit in final exam.
- The generic goal of learning a course is to have our name registered for credit. The generic practices are: register the course, pay the fee, purchase textbook, prepare learning tools, etc.

Four Features for Institutionalization

Commitment to perform

- Executives support with policies
- Staff work intelligently using standard processes

Ability to perform

- Has adequate resources and tools
- Has knowledge to perform job functions

Directing Implementation

- Perform job functions as specified in process standards

Verifying Implementation

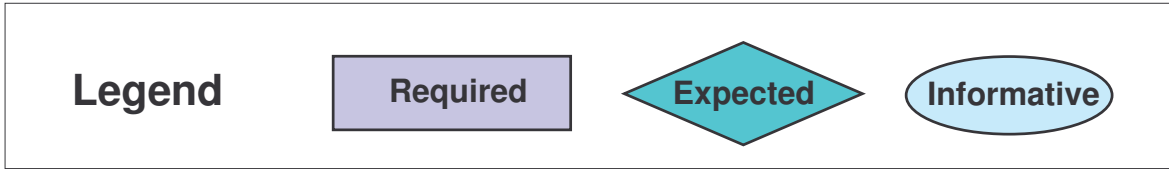
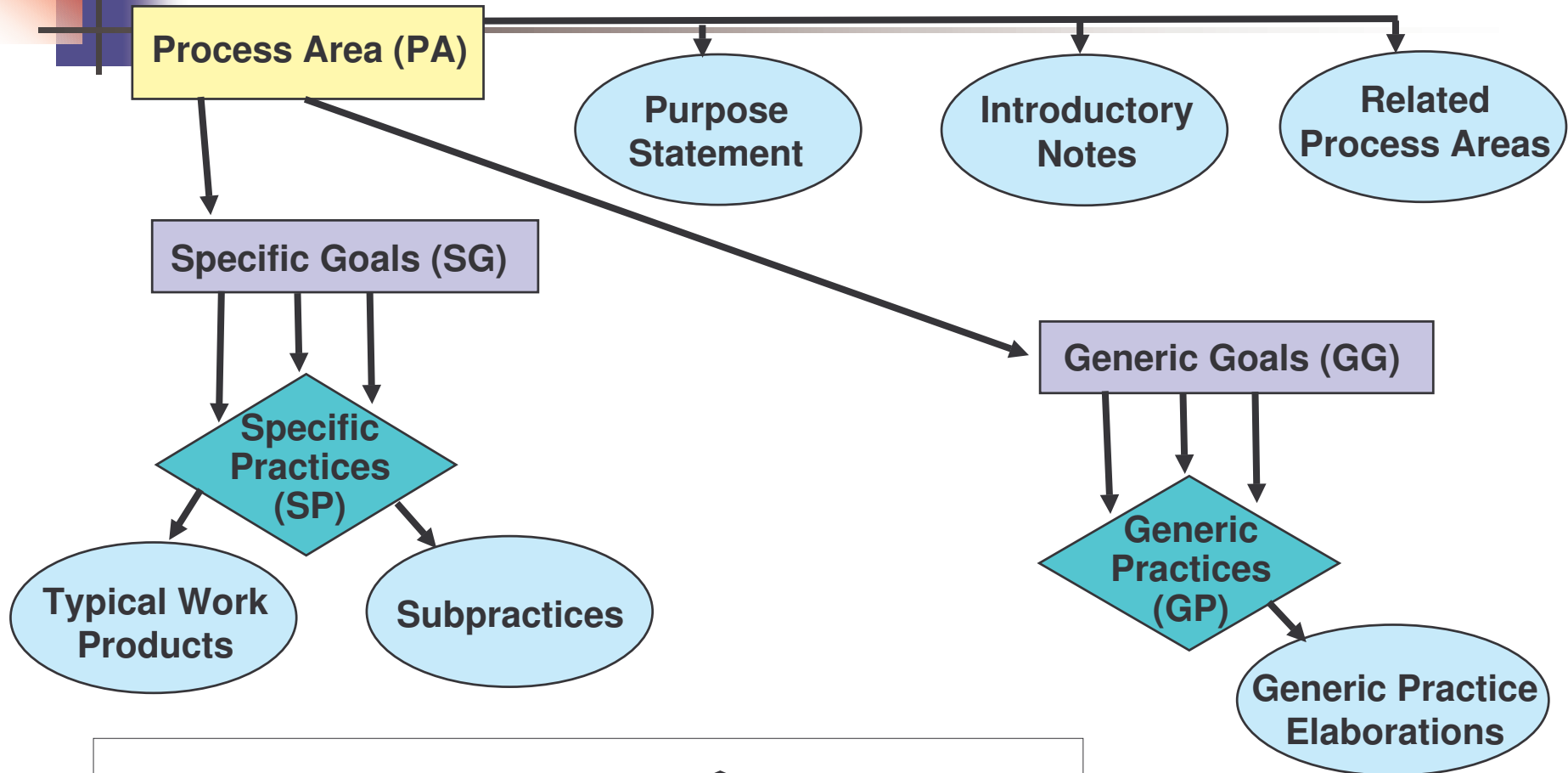
- Review the work done and report to the executives



Two Representations

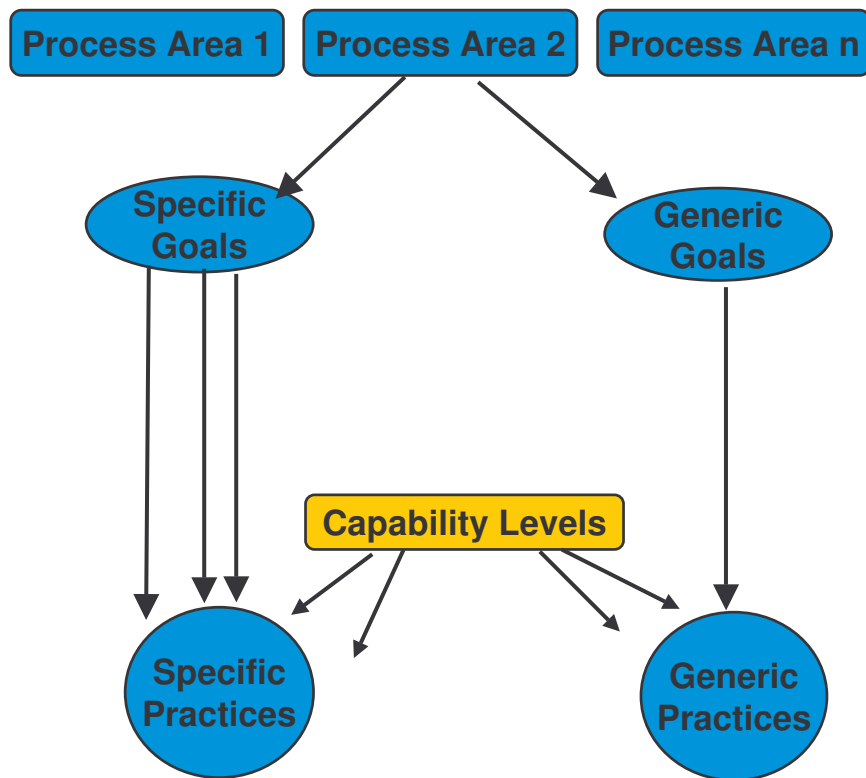
- Staged Representation
 - A systematic, structured way to approach process improvement one step at a time.
 - Achieving each step is a foundation for the next step.
 - There are five levels of maturity.
- Continuous Representation
 - A flexible approach to improve process performance. The organization may choose to improve a single PA or a group of PA's.
 - Organization may improve each PA at different rates.
 - There are six levels of process capability.

Process Area Components

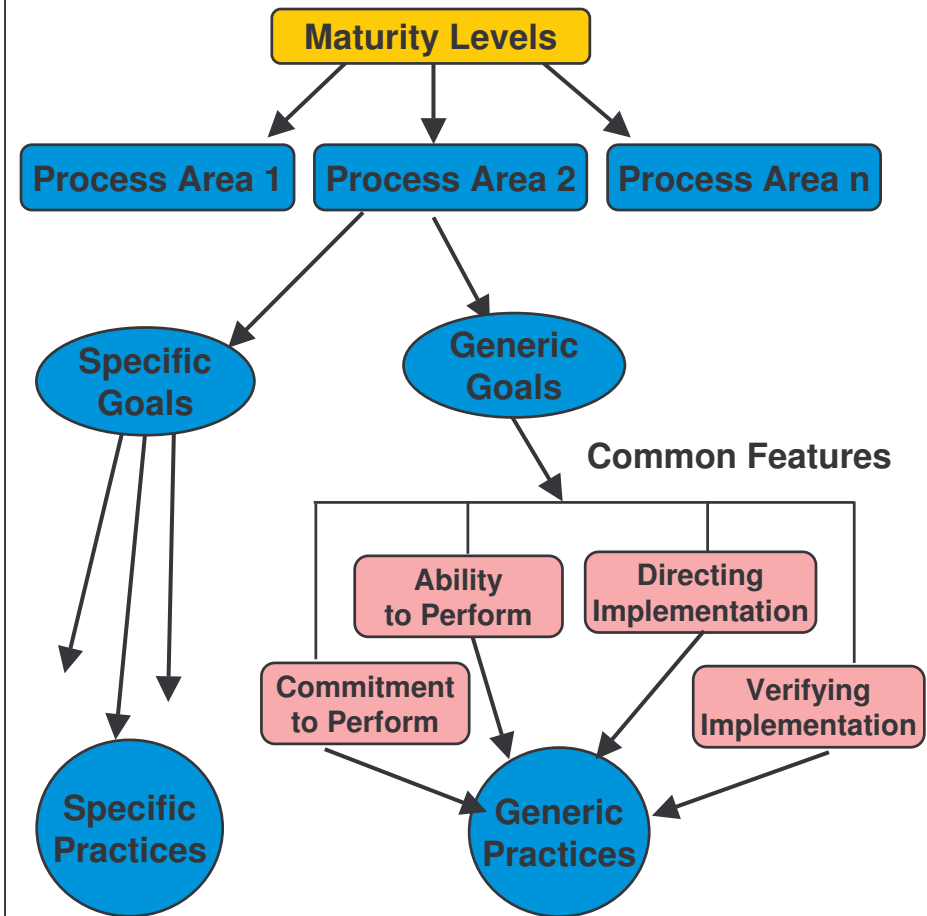


CMMI Model Structure

Continuous

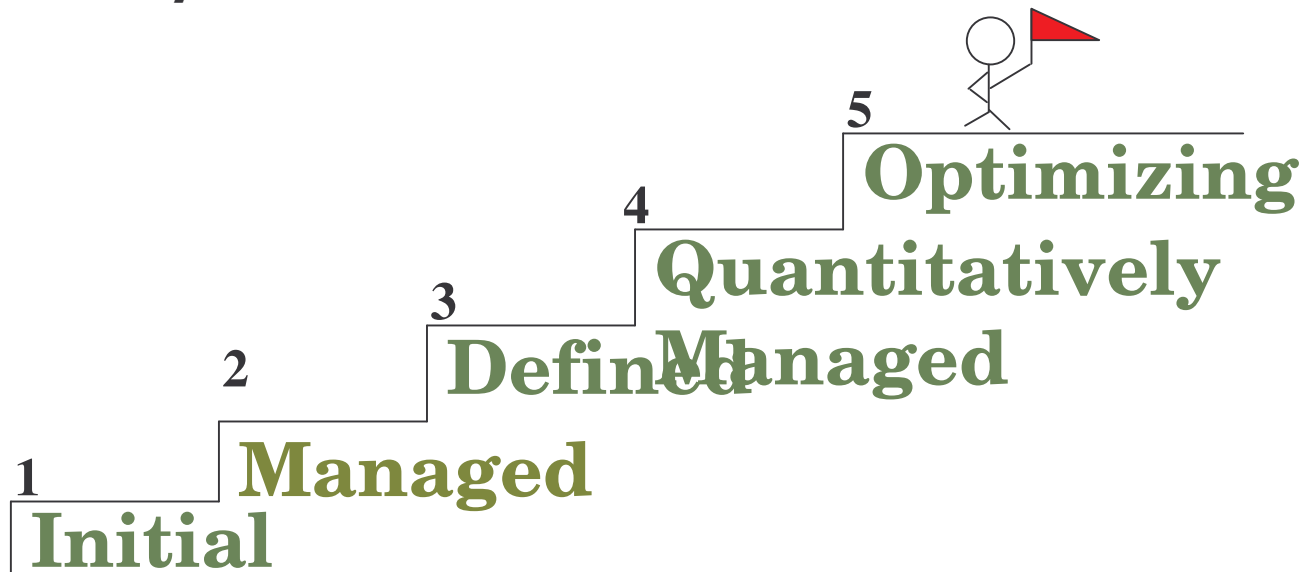


Staged



CMMI – Staged Representation

- Main ideas are to improve organization processes.
- Five Maturity Levels



- Each maturity level must have clear and rigorous processes



Capability Levels -

5 Optimizing

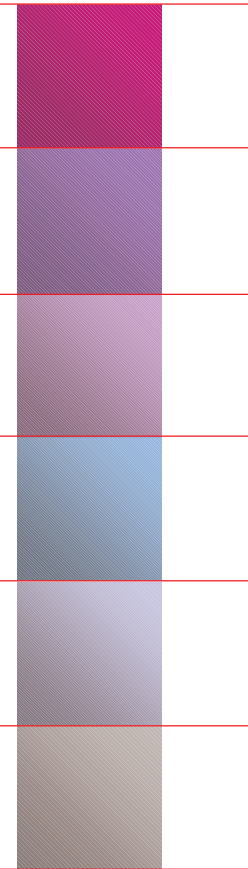
4 Quantitatively Managed

3 Defined

2 Managed

1 Performed

0 Incomplete



CMMI Implementation

- Lobby for executive support
- Select staff to attend Intro to CMMI course
- Create **EPG (Engineering Process Group)**
- Employ CMMI consultants
- Create appropriate organization policies
- Attend SPIN Group Meeting (at SW Park)
- Study materials in SEI website



Select Staged Representation

- Software organizations should select stage representation.
- Fundamental process areas are specified at Maturity Level 2 and are not too difficult to implement. These are
 - **Requirements Management**
 - **Project Planning**
 - **Project Monitoring and Control**
 - **Supplier Agreement Management**
 - **Measurement and Analysis**
 - **Process and Product Quality Assurance**
 - **Configuration Management**



SEPG Tasks

- **Study organization processes**
- **Write process standards**
- **Develop SDLC stages and details**
- **Create meeting procedures**
- **Create estimation procedures**
- **Create planning procedures**
- **Create Quality Assurance procedures**
- **Create Configuration Management Procedures**



Executive's Support

- **Sending staff to learn Project Management**
- **Sending staff to learn Quality Assurance**
- **Sending staff to learn Configuration Management**
- **Allocate resources to acquire tools**
- **Select pilot projects for implementation**



Managing Projects

- **Executive announces objectives of implementing CMMI**
- **Executive appoint a Project Leader to manage a selected project following the CMMI model**
- **Staff members are appointed as team members with appropriate roles. A project must have QA and CM.**
- **Customers must be informed of the intention to follow the CMMI model so that customers will appropriately participate in the project processes.**
- **Standard processes are followed strictly until the project is over.**



Learn and Improve

- After implementing CMMI in a few pilot projects, EPG should discuss the results and improve the software processes.
- All project staff should share the experience in using CMMI and recommendations must be given on improving the processes at the end of the projects.
- More projects should be implemented using the improved processes.



Thinking about Appraisal

- **Organization should think about Appraisal which is called SCAMPI-A.**
- **Appraisal can confirm that the organization implement CMMI correctly and provide insight into process improvement.**
- **Appraisal must be led by SCAMPI Lead Appraisor.**
- **Appraisal Team Members must be appointed to help LA to review documents and to interview staff members working in the projects.**



Three Phases of SCAMPI-A

- First Phase: Objective setting, Planning, Contracting
- Second Phase: Training of ATM, Document Review
- Third Phase: Onsite SCAMPI, Interviewing, Evidence Consolidation, Rating, Recommendation

The logo consists of a vertical black line intersecting a horizontal black line. To the left of the intersection, there are three overlapping squares: a yellow one at the top, an orange one in the middle, and a dark blue one at the bottom. The text "SPIN Group" is positioned to the right of the vertical line, with "SPIN" in a larger, bold, dark blue font and "Group" in a smaller, dark blue font.

SPIN Group

- Software Process Improvement Network
- The group tries to help members to understand improvement processes through:
 - Discussion
 - Special lecture
 - Site visit



Questions ? ? ? ? ?
