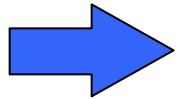




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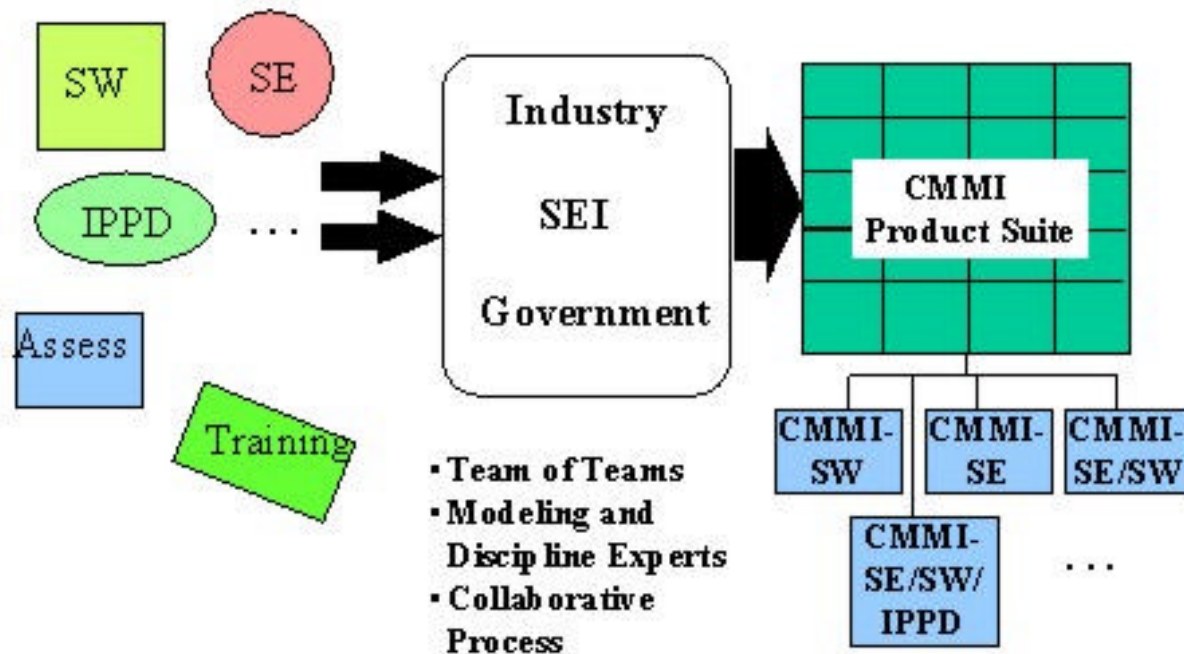
# *The CMMI Development Team*

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- U.S. Army, Navy, Air Force
- Federal Aviation Administration
- National Security Agency
- SEI
- ADP, Inc
- BAE/Marconi
- Boeing
- Computer Sciences Corp.
- EET Systems
- General Dynamics
- Harris Corp.
- Honeywell
- Litton
- Lockheed Martin
- Motorola
- Northrop Grumman
- Pacific Bell
- Raytheon
- Rockwell Collins
- Sverdrup Corp.
- Thomson SCF
- TRW

# The CMMI Solution

## A Product Line Approach



# *SEI's Evolving Policy*

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The CMMI Steering Group has established the schedule for the **sunset period** of the legacy models (I.e. SW-CMM) to be three years after release of the CMMI-SE/SW/IPPD Version 1.0 Product Suite, scheduled for and released in August 2000. A subsequent release, Version 1.1, is planned one year later to provide additional refinement and update based on the continuing CMMI pilot program.

# *CMMI Schedule*

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- August 31, 1999 Released CMMI-SE/SW V0.2 for public review
- December 20 1999 Released CMMI-SE/SW/IPPD for public review
- Nov 1999-Jun 2000 Initial pilot assessments, model revision
- Jun –Aug 2000 Publish Models V1.0
- August 2001 Publish models V1.1
- August 2003 Complete sunset period for precursor models  
( dropping support of other models SW -CMM, SE -  
CMM, etc.)

# *CMMI Transition Plan*

---

- Development Phase
  - Development of CMMI Products
  - Verification and Validation of CMMI products
- Transition Phase
  - Approval of initial CMMI Products for public release
  - Evidence of sufficient use
- Sustainment Phase
  - Upkeep and continuous improvement of the product suite
  - Additional evidence of adoption and use

Development Phase

Transition Phase

Sustainment Phase

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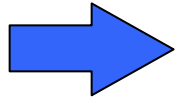
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# *CMMI Source Models*

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- Capability Maturity Model for Software Version 2, draft c (SW-CMM V2C)
- EIA Interim Standard 731, System Engineering Capability Model (SECM)
- Integrated Product Development Capability Maturity Model, draft V0.98 (IPD-CMM)

# Source Models for CMMI

## Terminology

<b>SW-CMM V2C</b>	<b>EIA IS 731 SECM</b>	<b>IPD-CMM V0.98</b>
<b>Staged</b>	<b>Continuous</b>	<b>Hybrid</b>
Maturity Levels	Capability Levels	Maturity and Capability Levels
Key Process Areas	Focus Areas	Process Areas
Key Process Area Goals	Themes	Capability and Process Area Goals
Activities Common Feature Common Features Commitment Ability Measurement and Analysis Verifying Implementation	Specific Practices Advanced Practices Generic Practices	Base Practices  Generic Practices
	Generic Attributes	

# Model Metrics

---

## PAAs and FAs

<u>Release</u>	<u>PAAs/ FAs</u>		<u>Goals/ Themes*</u>		<u>Activities/ Practices**</u>	
SW-CMM V1.1	18	} 61	52	} 199	316	} 1566
SW-CMM V2.0c	19		62		318	
EIA/IS 731	19		77		383	
IPD-CMM V.97	23		60		865	
CMMI V0.1 SE/SW	27		149		550	
CMMI V0.2 SE/SW	24		80		431	

\* Ratable components

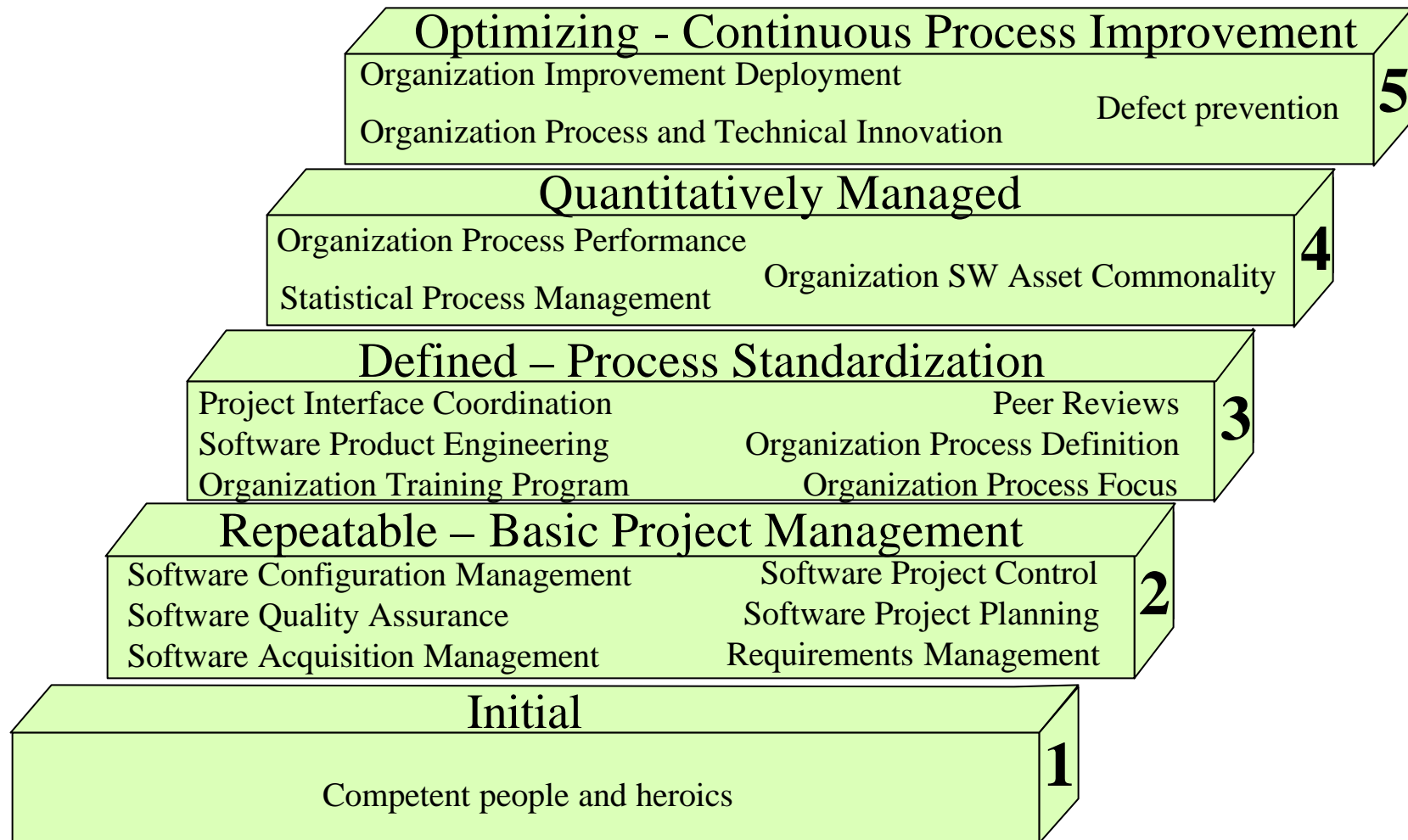
\*\* Key to Implementation Effort

# *Staged Representations*

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- Key Process Areas are grouped in the stages (Levels) from 2 to 5
- Each Key Process Area contains implementing practices (activities) to achieve the purpose of the process area.
- For a Key Process Area at a given stage, institutionalizing practices (common features) are integral to the process area.

# Staged Model SW-CMM V2.0 draft C



# *Continuous Representations*

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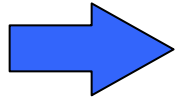
- A process area contains Specific Practices to achieve the purpose of the Process Area
- Some of these practices may reside at higher Capability Levels (Advanced Practices)
- Generic Practices are grouped to define Capability Levels and are added to the Specific Practices of each Process Area to attain a Capability Level for the Process Area.
- The order in which Process Areas are addressed can follow a recommended staging.

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# *CMMI Design Goals*

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- Integrate the models, eliminate inconsistencies and reduce duplication
- Reduce the cost of implementing model-based process improvement
- Increase clarity and understanding:
  - Common terminology
  - Consistent style
  - Uniform construction rules
  - Common components
- Assure consistency with ISO 15504
- Be sensitive to impact on legacy efforts

# *Background*

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- SEI had completed updates to the SW-CMM when the CMMI project was started
  - SW-CMM v2 Draft C was used as the source model for CMMI
  - Adapted for compatibility with SE
- Most of the community is currently using SW-CMM v1.1
  - Traceability matrices have been developed
  - Mapping is available

# Background

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- CMMI-SE/SW staged representation is similar to SW-CMMv1.1
  - Maturity Levels composed of Process Areas
  - Goals are **required**; implemented and institutionalized
  - Practices are **expected**; alternative practices are acceptable if effective at meeting the goals
  - All else is **informative**

# Current Status

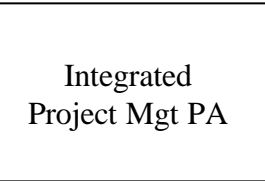
CMMI Levels	SW-CMM v1.1	CMMI
Level 2 Repeatable	Requirements Management Software Project Planning Software Project Tracking & Oversight Software Subcontract Mgmt Software Quality Assurance Software Configuration Mgmt	Requirements Management Project planning Project Monitoring and Control Supplier Agreement Management Process & Product Quality Assurance Configuration Management <b>Data Management</b> <b>Measurement and Analysis</b>
Level 3 Defined	Organizational Process Focus Organizational Process Training Program Integrated Software Mgmt Software Product Engineering Intergroup Coordination Peer Reviews	Organizational Process Focus Organizational Process Organizational Training <b>Integrated Project Mgmt</b> <b>Risk Management</b> <b>Customer and Product Requirements</b> <b>Technical Solution</b> <b>Product Integration</b> <b>Product Verification</b> <b>Validation</b> <b>Decision Analysis and Resolution</b>
Level 4 Managed	Quantitative Process Mgmt Software Quality Mgmt	<b>Org Process Performance</b> <b>Quantitative Mgmt of Quality &amp; Process</b>
Level 5 Optimizing	Defect Preventions Technology Change Mgmt Process Change Mgmt	<b>Causal Analysis and Resolution</b> <b>Org. Process Technology Innovation</b> <b>Process Innovation Deployment</b>

# Software Product Engineering

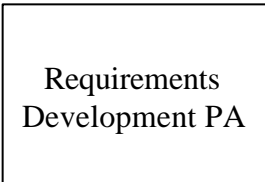
## SW-CMM v1.1 Activities

## CMMI Process Areas

1. Appropriate software engineering methods and tools are integrated into the project's defined software process. →



2. The software requirements are developed, maintained, documented, and verified by systematically analyzing the allocated requirements according to the project's defined software process. →

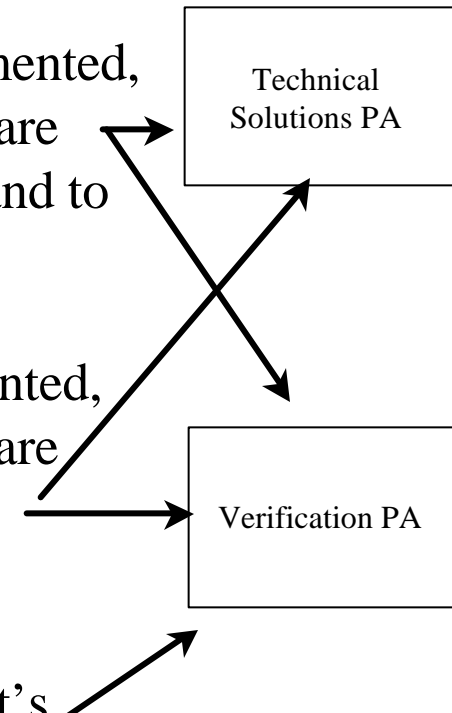
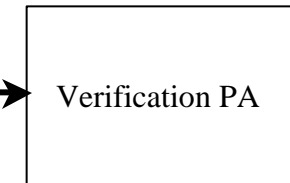
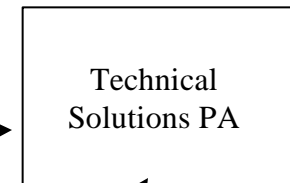


# Software Product Engineering

## SW-CMM v1.1 Activities

## CMMI Process Areas

3. The software design is developed, maintained, documented, and verified, according to the project's defined software process, to accommodate the software requirements and to form the framework for coding.
4. The software code is developed, maintained, documented, and verified, according to the project's defined software process to implement the software requirements and software design.
5. Software testing is performed according to the project's defined software process.

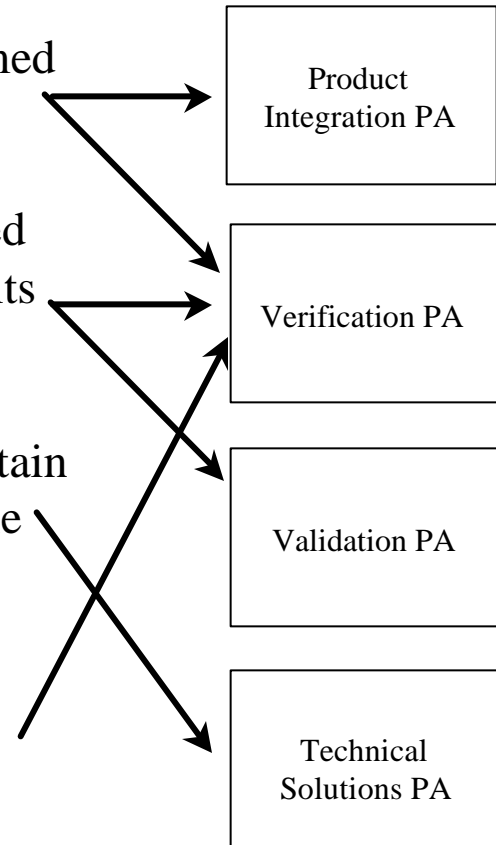


# Software Product Engineering

## SW-CMM v1.1 Activities

## CMMI Process Areas

6. Integration testing of the software is planned and performed according to the projects defined software process.
7. System and acceptance testing of the software are planned and performed to demonstrate that the software satisfies its requirements.
8. The documentation that will be used to operate and maintain the software is developed and maintained according to the project's defined software process.
9. Data on defects identified in peer reviews and testing are collected and analyzed according to the project's defined software process.

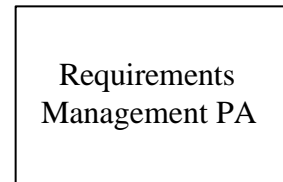
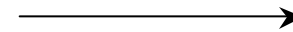


# Software Product Engineering

## SW-CMM v1.1 Activities

## CMMI Process Areas

10. Consistency is maintained across software work products, including the software plans, process descriptions, allocated requirements, software requirements, software design , code, test plans and test procedures.



# Common Feature Comparison

## Level 2

SW-CMM v1.1 Common Features	CMMI Common Features
Establish an Org. Policy	Establish an Org. Policy
Ability to Perform	Ability to Perform
Provide Resources	Plan the Process
Assign Responsibility	Provide Resources
Train People	Assign Responsibility
Activities Performed	Train People
Plan the Process	Specific Practices
Perform the Process	
Monitor and Control the Process	Perform the Process
	Directing Implementation
	Manage Configurations
	Monitor and Control the Process
Measurement Analysis	
Measurement Process	Expanded in the Measurement and Analysis PA
Analyze the Measurement	
Verify Implementation	Verify Implementation
Review with Org. Management	Review with Management
Review with Project Management	
Objectively Verify Adherence	Objectively Verify Adherence

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# Common Feature Comparison

## Level 3

SW-CMM v1.1 Common Features	CMMI Common Features
Establish an Org. Policy	Establish an Org. Policy
Ability to Perform	Ability to Perform
	Plan the Process
Provide Resources	Provide Resources
Assign Responsibility	Assign Responsibility
Train People	Train People
Activities Performed	Specific Practices
Plan the Process	
Perform the Process	Perform the Process
Monitor and Control the Process	
	Directing Implementation
	Manage Configurations
	Monitor and Control the Process
Measurement Analysis	Collect Improvement Information
Measurement Process	Expanded in the Measurement and Analysis PA
Analyze the Measurement	
Verify Implementation	Verify Implementation
Review with Org. Management	Review with Management
Review with Project Management	
Objectively Verify Adherence	Objectively Verify Adherence

# *Common Feature Comparison*

---

## Conclusions

Organizations using SW-CMM v1.1 should be able to smoothly transition to CMMI, accommodating the following changes:

- Measurement and Analysis & Data Management at Level 2
- Risk Management & Decision Analysis and Resolution at Level 3
- Expansion of Software Product Engineering
- Refocus on Measurement and Analysis Common Features to Directing Implementation Common Features.

Most SW-CMM v2 Draft C updates have been incorporated.

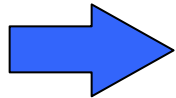
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# *CMMI Model Terminology*

---

## Staged to Continuous Model Terms

Item	Staged	Continuous
	Maturity Levels	Capability Levels Equivalent Staging
Rating Component	Process Areas	Process Areas
	Process Areas Goals	Process Areas Goals
Implementing Practices	Specific Practices	Specific Practices Advanced Practices
Institutionalizing Practices	Common Features Commitment Ability Directing Implementation Verifying Implementation	Generic Practices

# CMMI SE/SW/IPD Model

## Staged Representation

Level	Focus	Process Area
5 Optimizing	Quantitative Process Improvement	Organizational Innovation and Deployment Causal Analysis and Resolution
4 Quantitative Management	Quantitative Management	Organizational Process Performance Quantitative Project Management
3 Defined	Process Standardization	Requirements Development Technical Solution Product Integration Product Verification Validation Organizational Process Focus Organizational Process Definition Organizational Training Integrated Project Management Risk Management Decision Analysis and Resolution
2 Managed	Basic Project Management	Requirements Management Project Planning Project Monitoring and Control Supplier Agreement Management Measurement and Analysis Configuration Management Process and Product Quality Assurance

# *Structure of the CMMI*

---

## Continuous Representation

### Capability Levels

- A capability level is a well-defined evolutionary plateau describing the capability of any Process Area.
- There are 6 capability levels
  - 5 Optimization
  - 4 Quantitatively Managed
  - 3 Defined
  - 2 Managed
  - 1 Performed
  - 0 incomplete

# *Continuous Representation*

---

## Capability Level Contents

A narrative description of the capability level

- Generic Goals
  - A high-level statement of the outcome to be achieved by effective implementation of a group of Generic Practices as applied to a particular Process Area
- Generic Practices
  - A description of an action that will contribute to the achievement of a Generic Goal when applied to a particular Process Area
- Subpractices
  - Suggested courses of action that support Generic Practices.

# *Continuous Representation*

---

## Capability Level 0 - Incomplete

- Process is either not performed or partially performed.
- One or more specific goals of the process are are not satisfied.
- There are no complete Generic Goals or Generic Practices

# *Continuous Representation*

---

## Capability Level 1 - Performed

- All Specific Goals of the Process Area are satisfied.
- Essential activities are performed.
- The work is accomplished.
- However, the definition, planning, monitoring, and controlling of the process may be incomplete.
- Process may be unstable and inconsistently implemented. Quality , cost, and schedule objectives may not be met.

# *Continuous Representation*

---

## Capability Level 1 - Performed

- Generic Goal 1 Achieve Specific Goals

The process supports and enables achievement of the specific goals of the process area by transforming identifiable input work products to produce identifiable input work products.

# *Continuous Representation*

---

## Capability Level 1 - Performed

- General Practice 1.1 – Identify Work Scope  
Identify the scope of the work to be performed and work products or services to be produced, and communicate this information to those performing the work.
- General Practice 1.2 Perform Base Practices  
Perform the base practices of the process to develop work products and provide services to achieve the specific goals of the process area.

# *Continuous Representation*

---

## Capability Level 2 - Managed

- Process is planned, documented, performed, monitored, and controlled at the local (project/group) level.
- Process is institutionalized and has become an ingrained part of the way the work is performed.
- Achieves other objective that are established, such as cost, schedule, and quality objectives.

# *Continuous Representation*

---

## Capability Level 2 - Managed

### Generic Goal 2 Institutionalize a Managed Process

The Process is institutionalizes as a managed process.

- General Practice 2.1 – Established and Organizational Policy  
Establish and maintain an organizational policy for planning and performing the process
- General Practice 2.2 – Plan the Process  
Establish and maintain the requirements, objectives, and plan for performing the process.
- General Practice 2.3 – Provide Resources  
Provide adequate resources for performing the process, developing the work products, and providing the services of the process.

# *Continuous Representation*

---

## Capability Level 2 - Managed

- General Practice 2.4 – Assign Responsibility  
Assign responsibility and authority for performing the process, developing the work products and providing the services of the process.
- General Practice 2.5 – Train People  
Train the people performing or supporting the process as needed.
- General Practice 2.6 – Manage Configurations  
Place designated work product of the process under appropriate levels of configuration management. These are the artifacts of the process.
- General Practice 2.7 – Identify and Involve Relevant Stakeholders  
Identify and involve the relevant stakeholders as planned.

# *Continuous Representation*

---

## Capability Level 2 - Managed

- General Practice 2.8 – Monitor and control the Process  
Monitor and control the process against the plan, and take appropriate corrective action..
- General Practice 2.9 – Objectively evaluate Adherence  
Objectively evaluate adherence of the process and the work products and services of the process to the applicable requirements, objectives, and standards, and address non compliance.
- General Practice 2.10 – Review Status with Higher-Level Management  
Review the activities, status and results of the process with higher-level management and resolve issues.

# *Continuous Representation*

---

## Capability Level 3 - Defined

- Process is tailored from the organization's set of standard process and related organizational process assets.
- Organization's set of standard processes are established and Improved over time.
- Defined process is described in more detail and more rigorously than a managed process.
- Management establishes process objectives.

# *Continuous Representation*

---

## Capability Level 3 - Defined

### Generic Goal 3 Institutionalize a Defined Process

The Process is institutionalized as a defined process.

- General Practice 3.1 – Establish a Defined Process  
Establish and maintain the description of a defined process.
- General Practice 3.2 – Collect Improvement Information  
Collect work products, measures, measurement results, and improvement information derived from planning and performing the process to support the future use and improvement of the organization's processes and process assets.

# *Continuous Representation*

---

## Capability Level 4 – Quantitatively Managed

- Process is controlled using statistical and other quantitative techniques.
- Quantitative objectives for product quality, service quality, and process performance are established and used as criteria in managing the process.
- People performing the process are directly involved in quantitatively managing the process.
- Statistical predictability is achieved.

# *Continuous Representation*

---

## Capability Level 4 – Quantitatively Managed

### Generic Goal 4 Institutionalize a Quantitative Managed Process

The Process is institutionalized as a quantitative managed process.

- General Practice 4.1 – Establish Quality Objectives

Establish and maintain quantitative objectives for the process about quality and process performance based on customer needs and business objectives.

- General Practice 4.2 – Stabilize Subprocess Performance

Stabilize the performance of one or more subprocesses of the process to determine its ability to achieve the established quantitative quality and process performance objectives.

# *Continuous Representation*

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## Capability Level 5 – Optimizing

- Process is improved, changed, and adapted to meet relevant current and projected business objectives.
- Focus is on continually improving the range of process performance through incremental and innovative technological improvements.
- Quantitative process improvements objectives are established.
- Process improvement is inherently part of everybody's role, resulting in cycles of continual improvement..

# *Continuous Representation*

---

## Capability Level 5 – Optimizing

### Generic Goal 5 - Institutionalize an Optimizing Process

The process is institutionalized as a optimizing Process.

- General Practice 5.1 – Ensure Continuous Process Improvement  
Ensure continuous improvement of the process in fulfilling the relevant business goals of the organization.
- General Practice 5.2 – Correct Common Cause of Problems  
Identify and correct the root cause of defects and other problems in the process.

# Continuous Representation

## Process Areas

Process Management	Organizational Process Focus Organizational Process Definition Organizational Training Quantitative Management of Quality and Process Organizational Process Performance Causal Analysis and Resolution Organizational Process Technology Innovation Process Innovation Deployment
Project Management	Project Planning Project Monitoring and Control Supplier Agreement Management Integrated Project Management Risk Management Quantitative Project Management
Engineering	Requirements Management Customer and Product Requirements Technical Solution Product Integration Product Verification Validation
Support	Configuration Management Data Management Process and Product Quality Assurance Measurement and Analysis Decision Analysis and Resolution

# Agenda

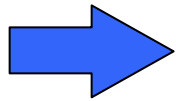
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# *CMMI-SE/SW/IPPD*

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## Definition

Integrated Product and Process Development (IPPD) is a systematic approach to product development that achieves a timely collaboration of relevant stakeholders throughout the product live cycle to better satisfy customer needs.

# *CMMI-SE/SW/IPPD*

---

## IPPD Background

Grew out of concurrent (or simultaneous) engineering

- Adopted by US industry in the 1980's to respond to the increasing global economic pressures
- Used multifunctional teams of design and manufacturing engineers to develop the manufacturing process concurrently with the product.

# *CMMI-SE/SW/IPPD*

---

DoD defined concurrent engineering as:

“A systematic approach to integrated, concurrent design of products and their related processes, including manufacture and support. This approach is intended to cause the developers, from the outset, to consider all elements of the product life cycle from conception through disposal, including quality, cost, schedule and user requirements.”

The Role of Concurrent Engineering in  
Weapon System Acquisition, Institute for  
Defense Analysis, Winner, et al.

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# *CMMI-SE/SW/IPPD*

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## IPPD Expanded

IPPD expands on concurrent engineering by adding processes, e.g.,

- Product-related processes are developed or tailored for standard processes concurrently with the product development.
- Teams involve relevant stakeholders spanning the life cycle of the product.

IPPD also expands on the technical integration employed in disciplined, systems engineering approach to integrate business functions as well as technical functions.

# *CMMI-SE/SW/IPPD*

---

Several DoD actions paved the way for DoD to formally adopt IPPD principles:

- Defense Science Board Study (DSB) on Engineering in the manufacturing Process (Summer, 1992)
  - Based on industry success with IPPD, the DSB members recommended that DoD employ IPPD in its practices and relationships with industry.
- Formation of the Defense Manufacturing Council and the Office of Systems Engineering
- Acquisition Reform activities

# *CMMI-SE/SW/IPPD*

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On May 10, 1995 Secretary Perry directed the DoD to apply Integrated Product and Process Development (IPPD) and Integrated Product and Integrated Product Teams (IPTs) throughout the acquisition process to the maximum extent practical.

# *CMMI Project Requirements*

---

Reduce redundancy and complexity encountered when using multiple Capability Maturity Model and related Capability Models (CMs).

Provide industry and government with a set of integrated products to support process and product improvement

- Improve the efficiency of and the return on investment for process improvement

Develop a new model encompassing the SE and SW disciplines and IPPD concepts.

# *Scope of IPPD*

---

IPPD practices are expected to be Integrated with the other practices in the CMMI SE/SW/IPPD model.

Organizations are expected to perform IPPD practices concurrently with the SE and SW practices.

In the CMMI SE/SW/IPPD model there are:

- Two new Process Areas
- Two new specific goals in Integrated Project Management
- IPPD amplifications and references added to non-IPPD model components.

# *CMMI-SE/SW/IPPD*

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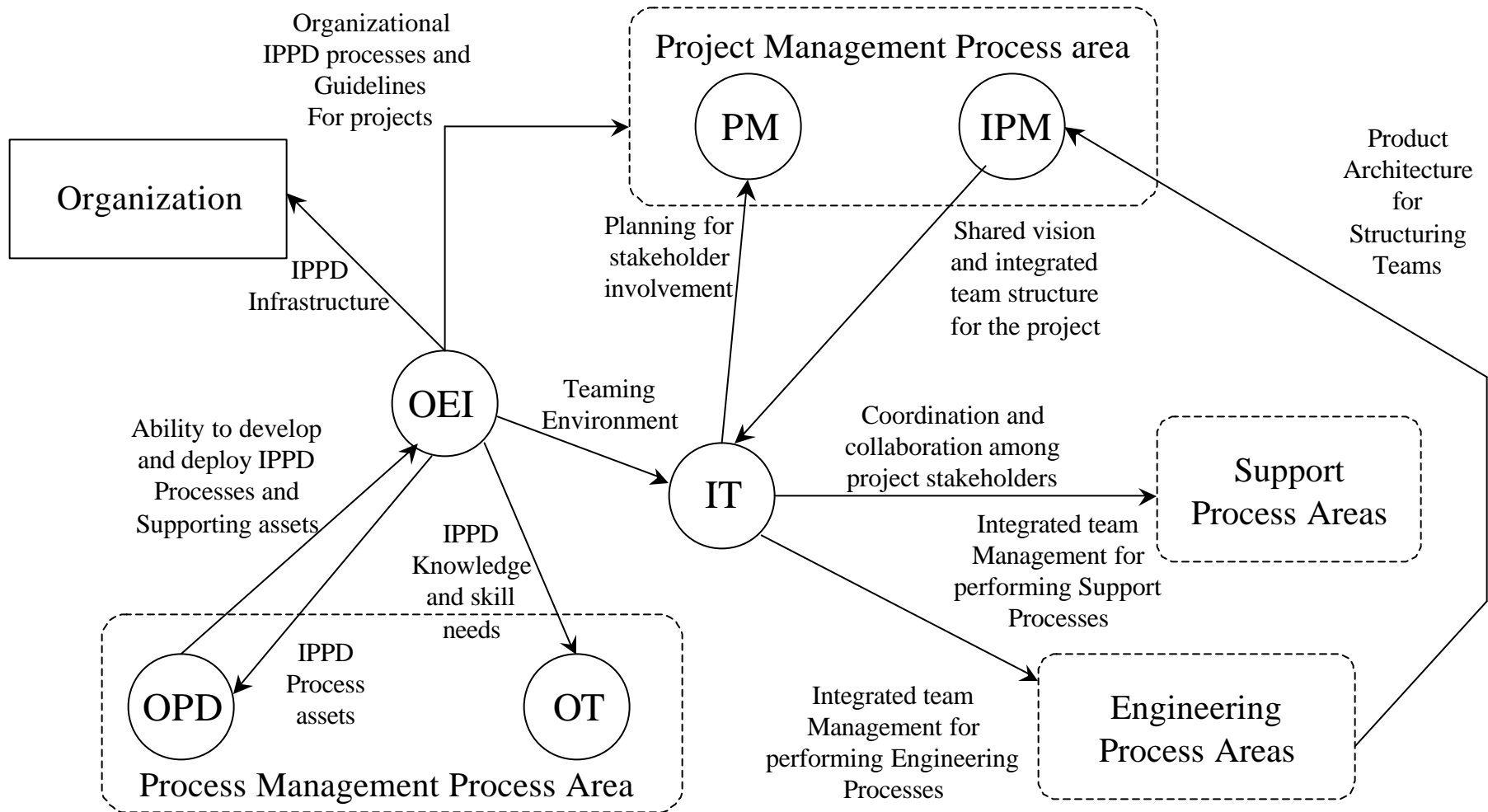
## Staged and Continuous Representations

All IPPD process areas and specific goals and practices are at Maturity Level 3 in the Staged Representation.

Amplifications and references are also added to Maturity Levels 2 and 3 non-IPPD process areas because these process areas need to be implemented differently when IPPD is being practiced.

# CMMI-SE/SW/IPPD

## IPPD Environment



# *IPPD Fundamental Concepts*

---

## Location in Model

The design of downstream processes during the product design SE/SW/IPPD

Focus on the customer's needs during product and process development SE/SW

Continuous and proactive identification and management of risk SE/SW

Use of IPPD teams SE/SW/IPPD

Timely and appropriate collaboration of all relevant stakeholders SE/SW

Leadership commitment to IPPD SE/SW/IPPD

# *IPPD Fundamental Concepts*

---

## Location in Model

Organizational structure that rewards team performance

SE/SW

Appropriate allocation and delegation of decision-making

SE/SW/IPPD

Focus on measurement and improvement of processes to develop and deliver the product

SE/SW

# Agenda

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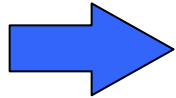
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IPPD Process Areas and Specific Goals

Wrap-up

# *IPPD Process Areas*

---

Integrated Project Management IPM in SE/SW/IPPD includes:

- Two goals from SE/SW
- Two IPPD specific goals

Integrated Teaming (IT)

Organizational Environment for Integration (OEI)

# *IPPD Process Areas*

---

## Integrated Project Management (IPM) Process Area

### SE/SW specific Goals

- Use the Project's Defined Process
- Coordinate and Collaborate with Relevant Stakeholders

### SE/SW/IPPD includes two more specific goals

- Create a Shared Vision for the Project
- Organize Integrated Teams

# *Integrated Project Management*

## Purpose

Establish and manage the project and the involvement of the relevant stakeholders according to the integrated and defined process that is tailored from the organization's set of standard processes. Establish a shared vision for the project and organize integrated teams.

# *Integrated Project Management*

## Specific Goals (SG)

### SG1: Use the Project's Defined Process

The project is conducted using a defined process that is tailored from the organization's set of standard processes.

### SG2: Coordinate and Collaborate with Relevant Stakeholders

Coordination and collaboration of the project with relevant stakeholders is conducted.

# *Integrated Project Management*

## Specific Goals (SG)

### SG3: Create a Shared Vision for the Project

A shared vision is created by and for the project.

### SG4: Organize Integrated Teams

The integrated teams needed to execute the project are identified, defined, structured, and tasked.

# Mapping of Goals and Practices

## Specific Goals

## Practices

---

Use the Project's  
Defined Processes

- Establish the Project's Defined Process
- Use Organizational assets for Planning Project Activities
- Integrated Plans
- Manage Project Using Integrated Plans
- Contribute to Organizational Process Assets

---

Coordinate and  
Collaborate with  
Relevant  
Stakeholders

- Manage Stakeholder Involvement
- Manage Dependencies
- Resolve Coordination Issues

# Mapping of Goals and Practices

## Specific Goals

## Practices

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### Shared Vision

- Define the Projects Shared Vision Context
- Establish a Shared Vision for the Project
- Evaluate use and Effectiveness of the Shared Vision

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### Organize Integrated Teams

- Determine Team Structure for Project
- Develop a Plan for Distributing Requirements to Teams
- Establish Teams

# *Integrated Project Management*

## Summary

Integrated Project Management involves:

- Tailoring the projects defined process form the organizations set of standard processes
- Managing the project using integrated plans
- Using and contributing to the organization's process assets
- Enabling each relevant stakeholder's unique expertise and concerns to be identified and considered during the development of the product

# *Integrated Project Management*

## Summary (continued)

Integrated Project Management involves:

- Ensuring that the relevant stakeholders associated with the project coordinate their efforts in a timely manner:
  - To address system requirements, plans, objectives, issues, and risks;
  - To make their commitments; and
  - To identify, track and resolve issues
- Establishing a shared vision for the project aligned with the shared vision of the organization; and evaluating the performance of the shared vision.

# *Integrated Project Management*

## Summary (continued)

Integrated Project Management involves:

- Determining the structure of the team which will be executing the project's tasks;
- Deciding on the allocation of responsibilities to teams;
- Establishing the teams; and
- Managing the performance of the team structure.

# *IPPD - New Process Areas*

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## IPPD Introduces Two New Process Areas

Maturity Level 3 specific goals and specific practices set the IPPD environment for accomplishing projects.

- Integrated Teaming (IT)
- Organizational Environment for Integration (OEI)

# *IPPD - New Process Areas*

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## State of the Practice of IPTs

- A recent SEI study of the practice of Integrated Product Teams (IPTs) found that the use and effectiveness of IPTs varies across the DoD and defense industry.
- IPT is now a recognizable concept across the DoD.
- When IPTs are implemented well, they provide excellent outcomes, along the lines predicted in DoD guidance and training briefings.
- It is not trivial to implement IPTs well and there are often problems.
- The implementation of IPTs in the DoD is an integral part of a much larger, interdependent system of process improvements.

# *Integrated Teaming*

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## Purpose

To form and sustain an integrated team for the development of work products.

# *Integrated Teaming*

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## Specific Goals (SG)

SG1: Establish team composition.

Team composition that provides the knowledge and skills required to deliver the team's products is established and maintained.

SG2: Govern team operation.

Operation of the integrated team is governed according to established principles.

# Mapping of Goals and Practices

## Specific Goals

## Practices

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Establish Team  
Composition

- Identify Team Tasks
- Identify Knowledge and Skills Needed
- Assign Appropriate Team Members

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Govern Team  
Operation

- Establish the Shared Vision
- Establish a Team Charter
- Define Roles and Responsibilities.

# *Integrated Teaming*

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## Summary

Integrated Teaming includes:

- Identifying and defining the team's internal tasks to generate the team's expected output.
- Identifying the knowledge, skills and functional expertise needed to perform the team's tasks and assigning the appropriate personnel to be team members
- Establishing and maintaining the team's shared vision and the team charter
- Defining and maintaining the roles and responsibilities of each team member
- Establishing and maintaining integrated team operating procedures and collaboration among interfacing teams

# *Integrated Teaming*

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## Related Process Areas for IT

### Integrated Project Management

- Coordinating and collaborating with relevant stakeholders and considering IPPD organizational process assets in project's defined process.
- Creating a project shared vision and organizing integrated teams for project execution

### Project Planning

- Planning for project execution [tasks, knowledge, skills] within an IPPD environment where integrated teaming is involved.

### Organizational Environment for Integration

- Establishing and maintaining an integrated work environment and creating organizational process assets for IPPD including an organizational shared vision.

# *Organizational Environment for Integration*

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## Purpose

To establish an organizational infrastructure and organizational process assets that are unique to IPPD.

# *Organizational Environment for Integration*

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## Specific Goals (SG)

SG1: Provide IPPD Infrastructure.

An infrastructure is provided that maximizes the productivity of people and effects the collaboration necessary for Integration.

SG2: Provide Organizational Process Assets for IPPD.

Organizational process assets unique to IPPD are provided.

# *Organizational Environment for Integration*

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## Specific Goals (SG)

SG1: Provide IPPD Infrastructure.

An infrastructure is provided that maximizes the productivity of people and effects the collaboration necessary for Integration..

SG2: Provide Organizational Process Assets for IPPD.

Organizational process assets unique to IPPD are provided.

# *Organizational Environment for Integration*

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## Goal

## Practices

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Provide IPPD  
Infrastructure

- Establish the Organization's Shared Vision
  - Identify IPPD Unique Knowledge and Skills
  - Establish a Reward and Recognition Process
  - Establish an Issue Resolution Process
  - Establish an Integrated Work Environment
- 

Provide IPPD  
Organizational  
Process Assets

- Establish Guidelines for Shared Vision Building
- Establish a Context-Setting Process for Decision-Making
- Establish Guidelines for Empowerment.
- Establish Guidelines to Balance Team and Home Organization Responsibilities

# *Organizational Environment for Integration*

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## Summary

### Organizational Environment for Integration Includes:

- Establishing an organizational shared vision and guidelines for building other shared visions.
- Establishing IPPD-unique knowledge and skill requirements
- Establishing an issues resolution process and empowerment and decision-making guidelines
- Establishing a reward and recognition process for team behavior
- Establishing an integrated work environment
- Establishing guidelines to balance team and home organization responsibilities

# *Organizational Environment for Integration*

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## Related Process Areas for OEI

### Organizational Process Definition

- Definition of the organizational process assets

### Organizational Training

- Identifying training needs and providing the necessary training

### Project Planning

- Identifying stakeholders and their level of involvement

### Integrated Project Management

- Coordinating and collaborating with relevant stakeholders

### Decision Analysis and Resolution

- Structured decision making

# Agenda

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Introduction

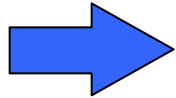
CMMI Source Models

CMMI Development and Model Comparisons

Structure of the CMMI

Integrated Product and Process Development (IPPD)

IPPD Process Areas



Wrap-up

# Wrap-Up

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- CMMI is here to stay
- Three year transitioning period.
- IPPD has been added in the past year.
- Software Acquisition Process
- Evolving but will stabilize – maybe.
- SCAMPI SM Version 1.0 (Standard CMMI SM Assessment Method for Process Improvement) method description has been published.

# Wrap-Up

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- The adding of the Software Acquisition Process to come
- Evolving but will be stabilizing – maybe.
- SCAMPI SM Version 1.0 (Standard CMMI SM Assessment Method for Process Improvement) method description has been published.