

# **CMMI® V1.3**

## **Planned Improvements**

**SSTC**  
**April 28, 2010**

Software Engineering Institute  
Carnegie Mellon University

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# How Do You Want to Work?



- Random motion – lots of energy, not much progress
- No teamwork – individual effort
- Frequent conflict
- You never know where you'll end up

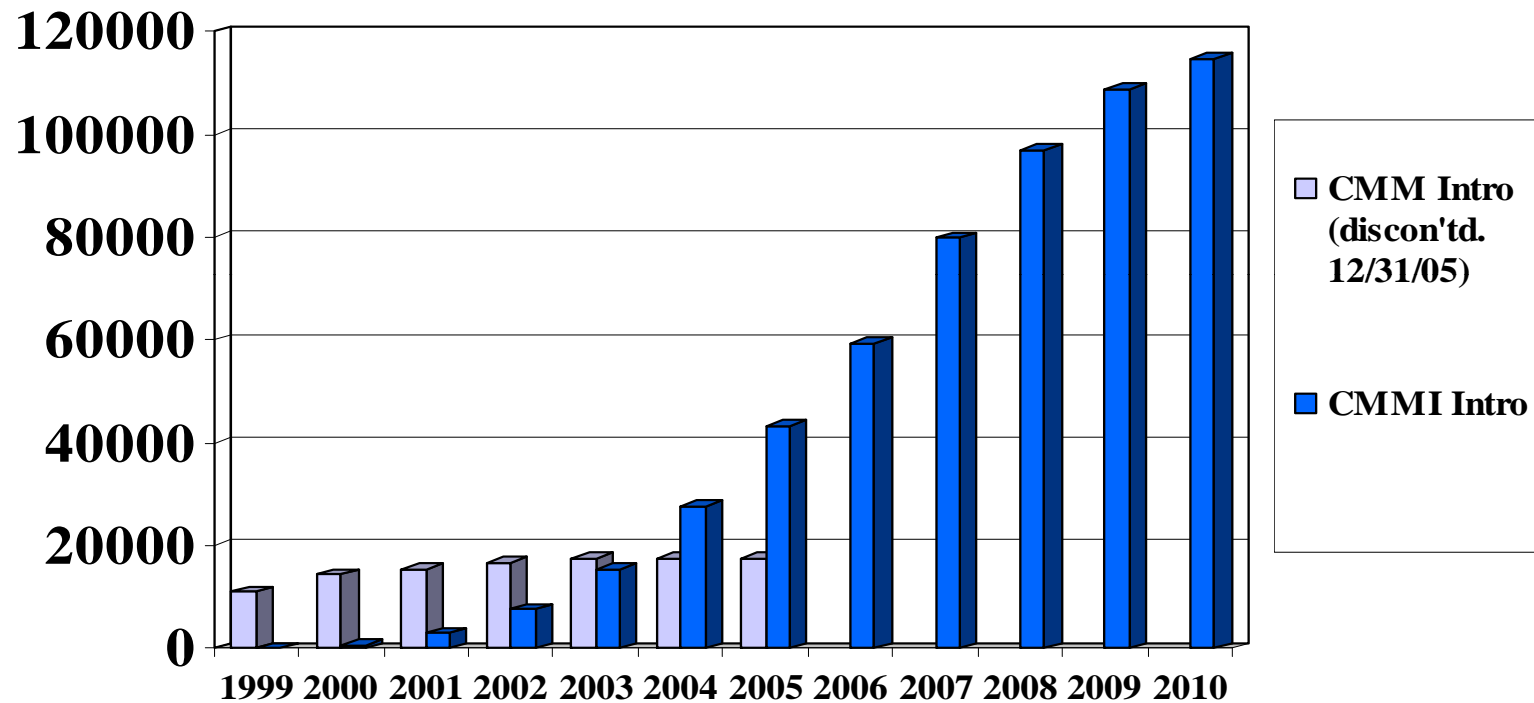


- Directed motion – every step brings you closer to the goal
- Coordinated efforts
- Cooperation
- Predictable results

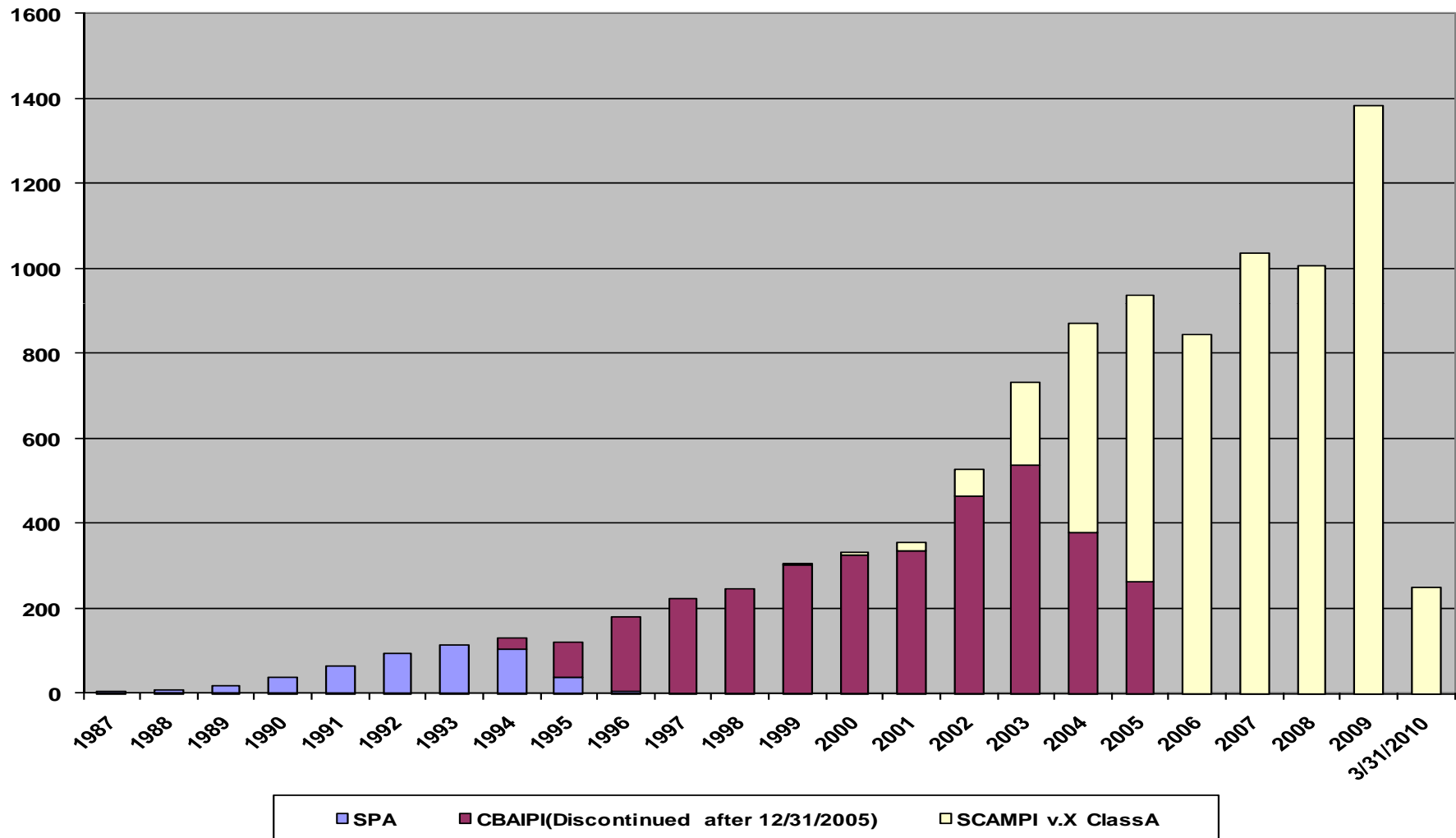
**Processes can make the difference!**



# Introduction to CMMI Attendees Cumulative as of 3-31-10

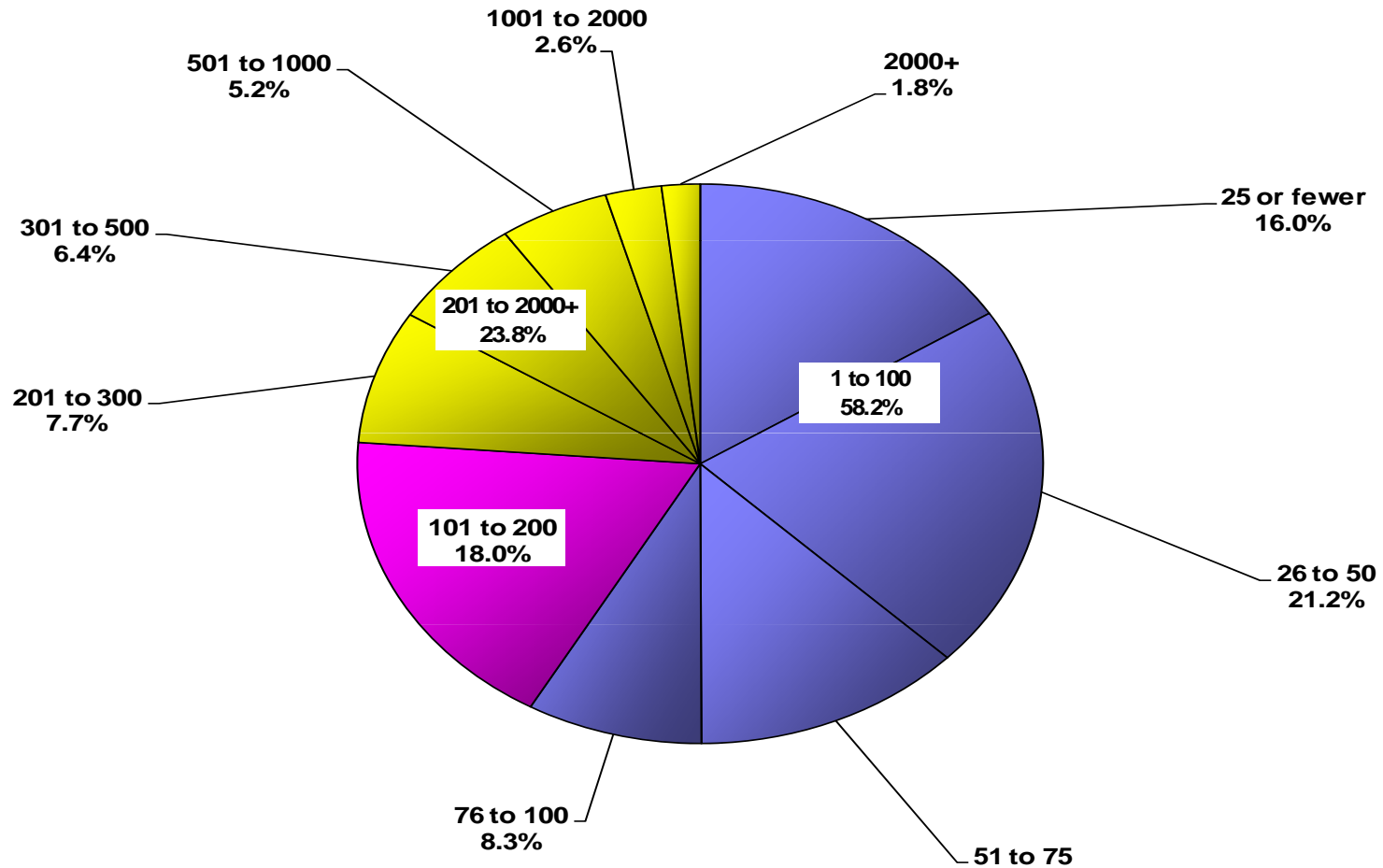


# Number of Appraisals Conducted by Year Reported as of 3-31-10

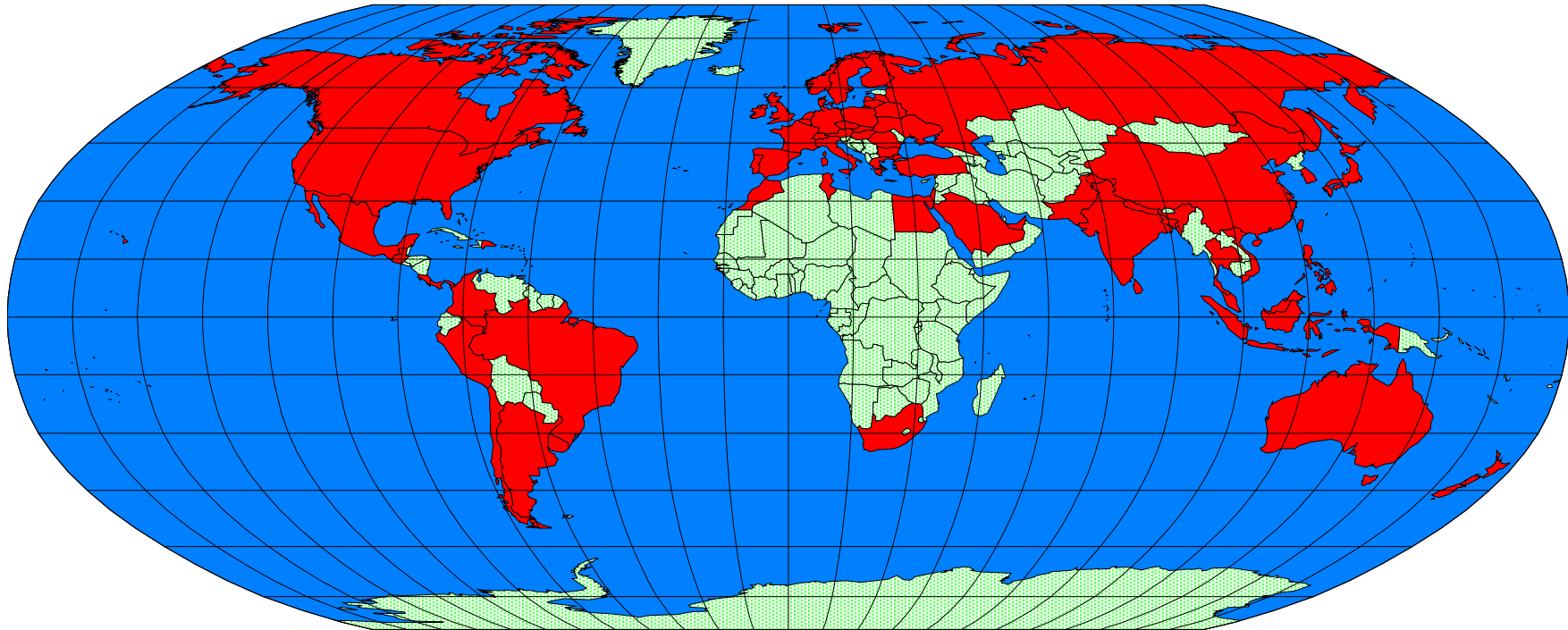


# Organization Size

Based on the total number of employees within the area of the organization that was appraised



# Countries where Appraisals have been Performed and Reported to the SEI

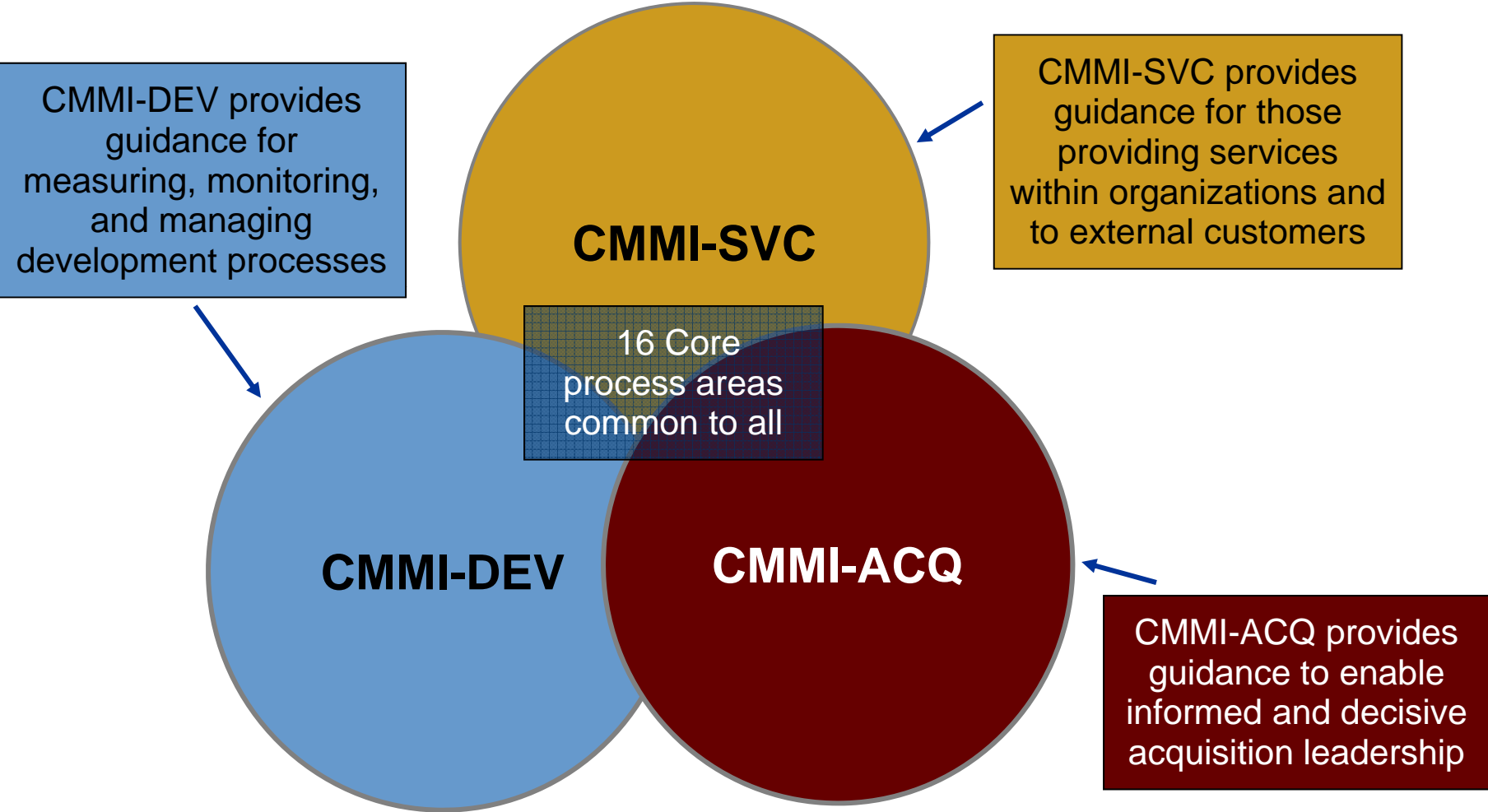


Argentina	Australia	Austria	Bahrain	Bangladesh	Belarus	Belgium	Brazil
Bulgaria	Canada	Chile	China	Colombia	Costa Rica	Czech Republic	Denmark
Dominican Republic	Egypt	Finland	France	Germany	Greece	<b>Guatemala</b>	Hong Kong
Hungary	India	Indonesia	Ireland	Israel	Italy	Japan	Korea, Republic Of
Latvia	Lithuania	Luxembourg	Malaysia	Mauritius	Mexico	Morocco	Nepal
Netherlands	New Zealand	Norway	Pakistan	Panama	Peru	Philippines	Poland
Portugal	Romania	Russia	Saudi Arabia	Singapore	Slovakia	South Africa	Spain
Sri Lanka	Sweden	Switzerland	Taiwan	Thailand	<b>Tunisia</b>	Turkey	Ukraine
United Arab Emirates	United Kingdom	United States	Uruguay	Viet Nam			

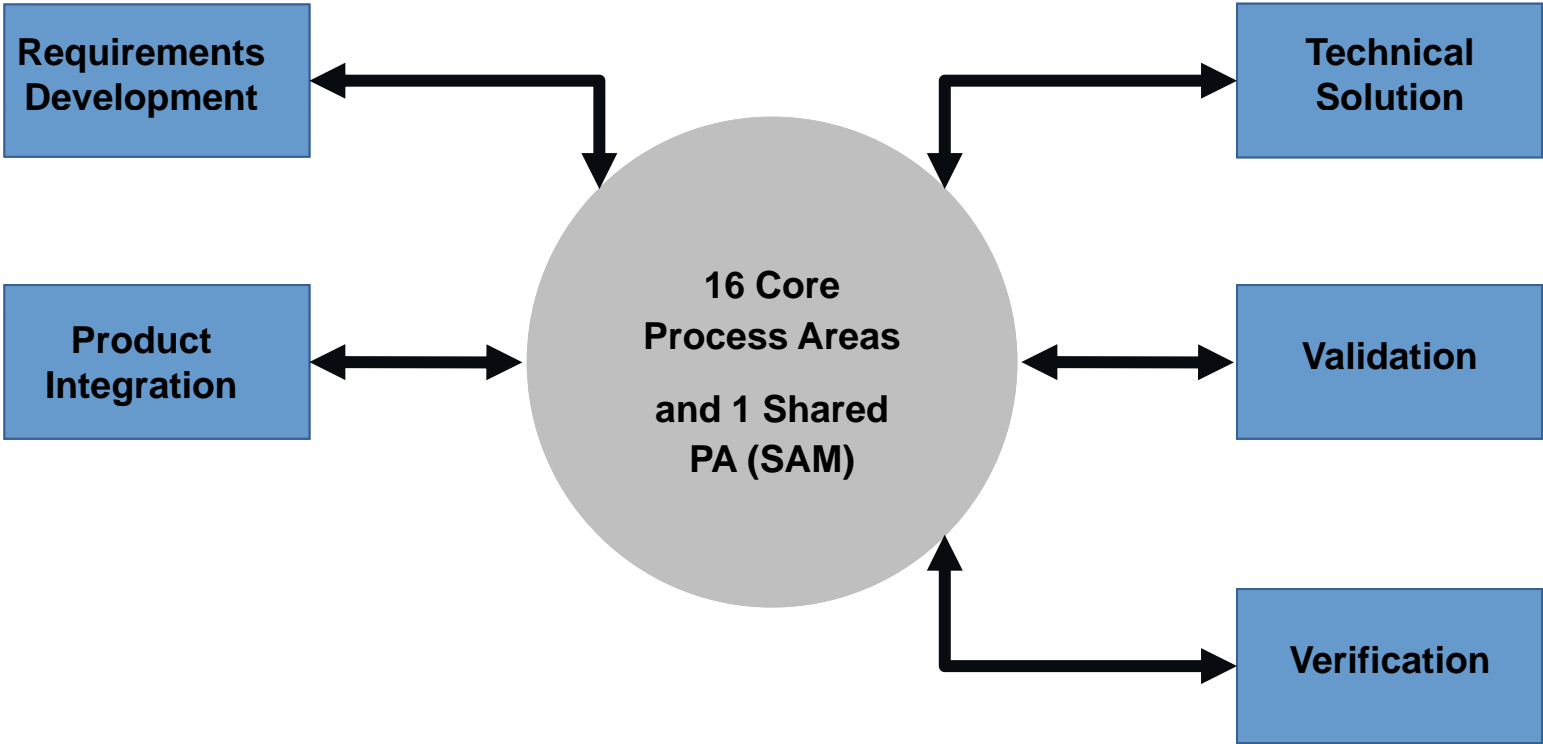
\* Red country name: New additions with this reporting since Sep.2009



# Three Complementary Constellations

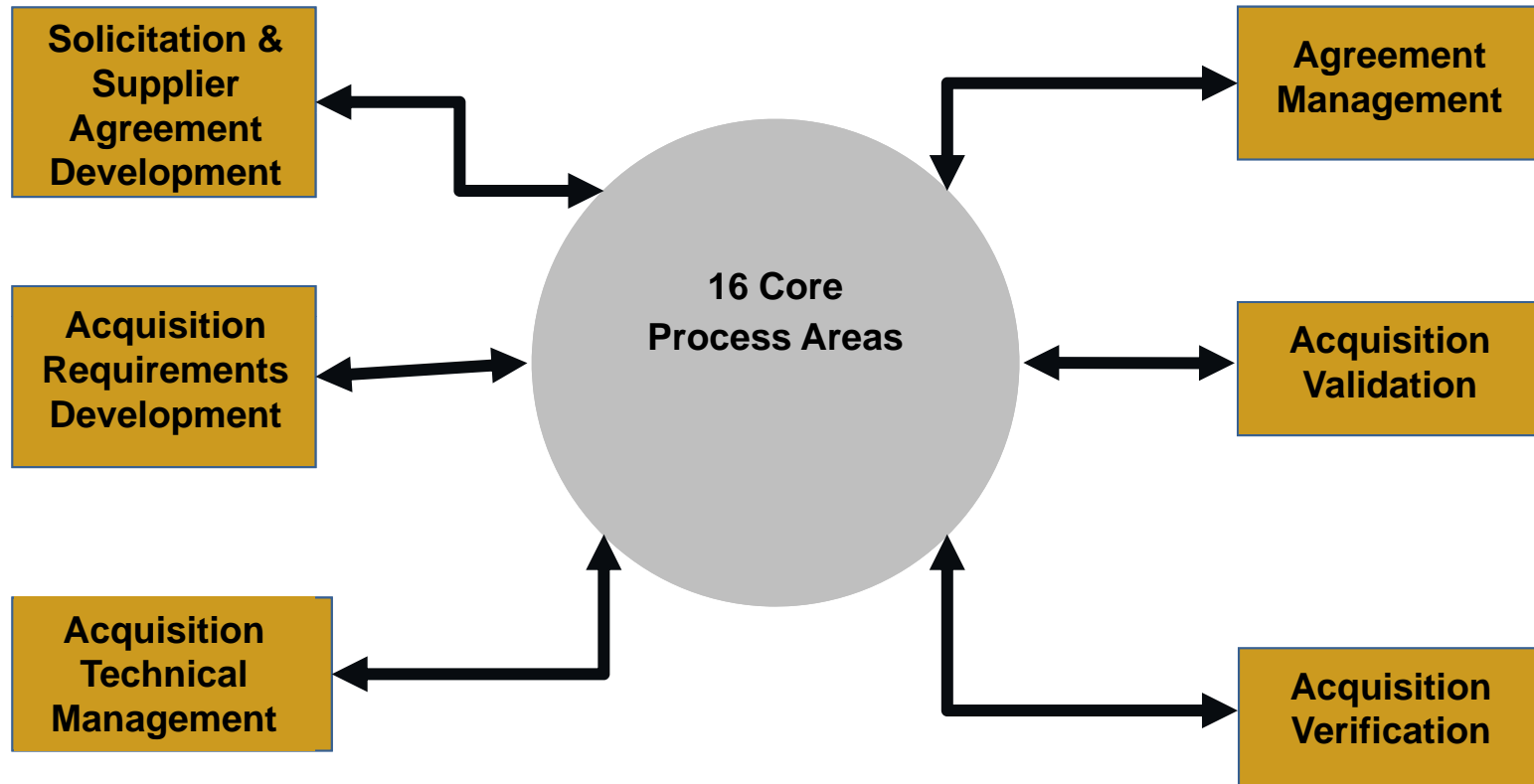


# CMMI-DEV V1.2

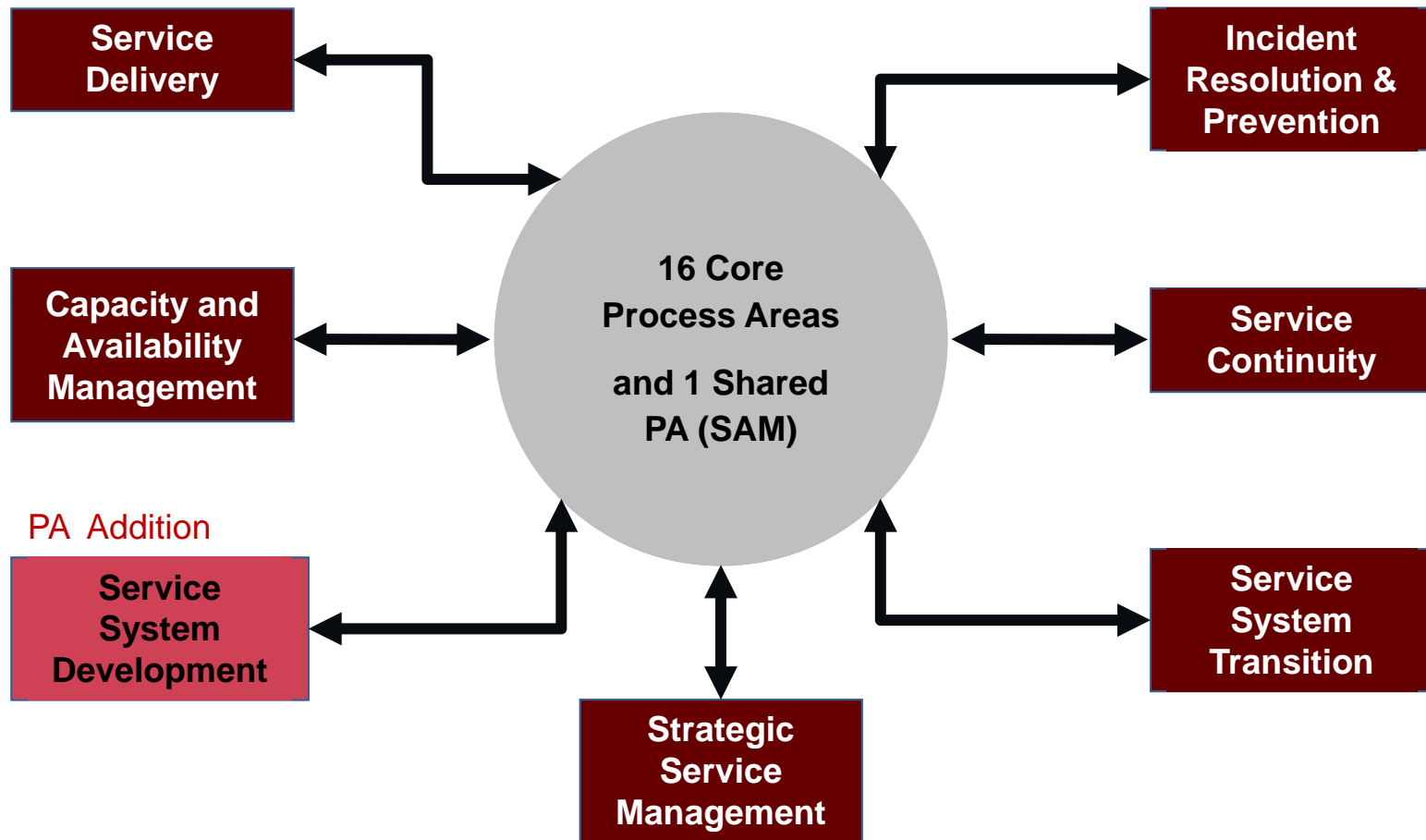




# CMMI-ACQ V1.2



# CMMI-SVC V1.2



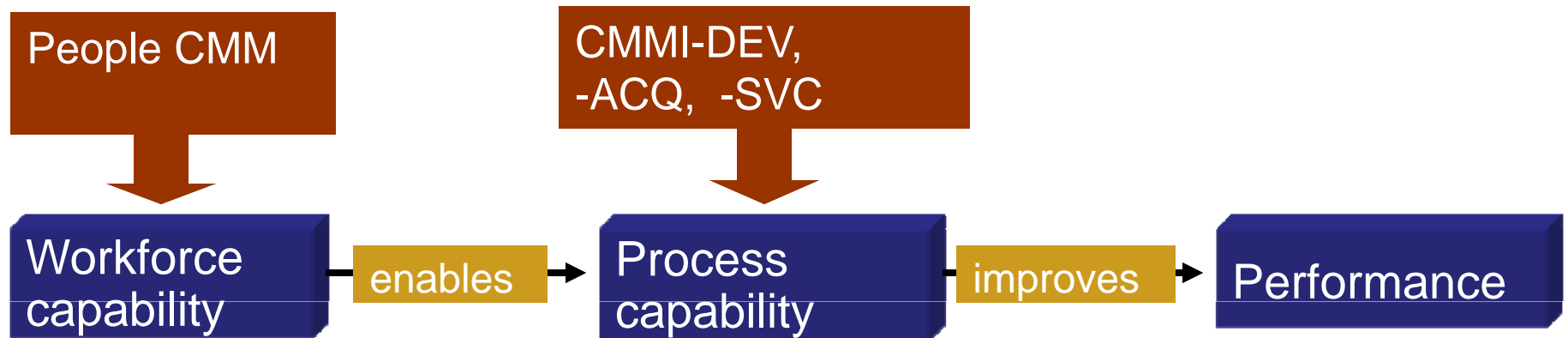
# People Capability Maturity Model: Primary Objective

The primary objective of:

a CMM is to improve the **capability** of an organization's processes. CMMI (DEV, ACQ, SVC) is to improve the **capability** of an organization's processes within specific domains.

the People CMM is to improve the **capability** of an organization's workforce through enhanced management and human capital processes.

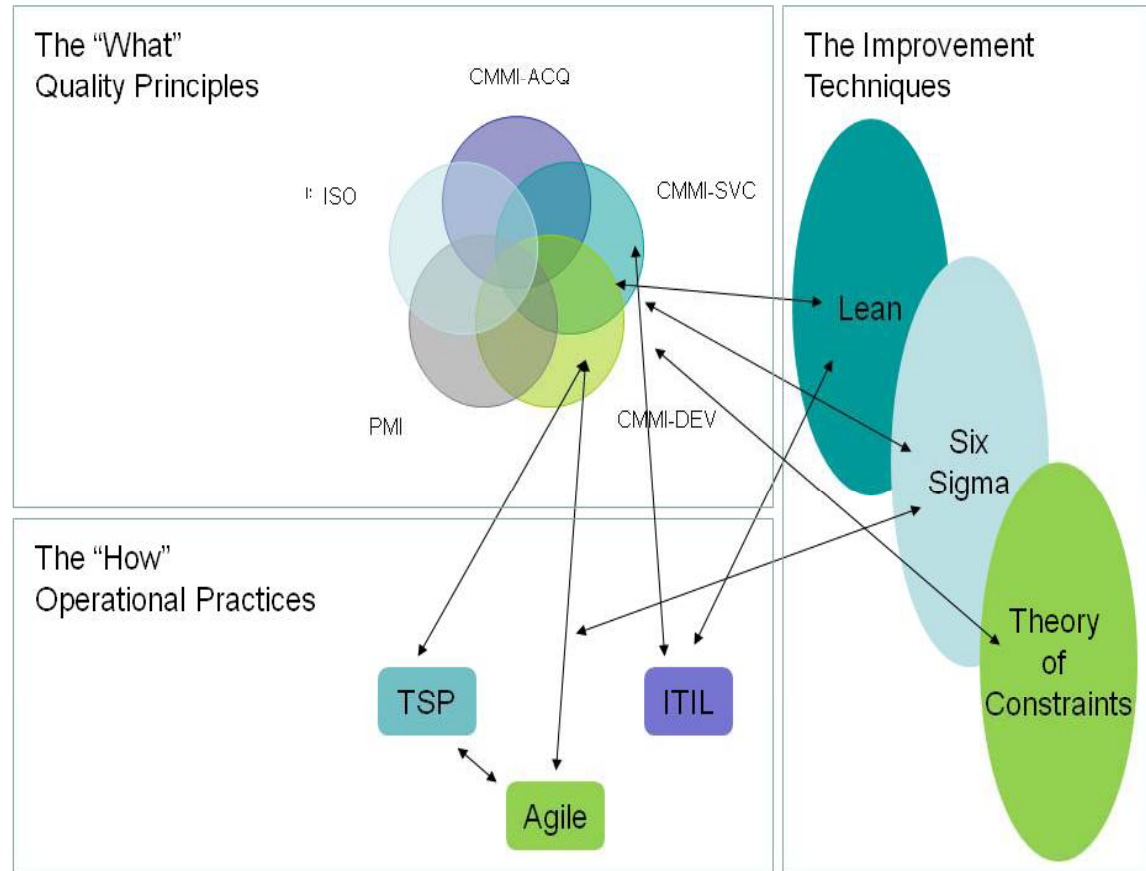
*(People CMM defines **capability** as the level of **knowledge**, **skills**, and **process abilities** available within each workforce competency of the organization to build its products or deliver its services.)*



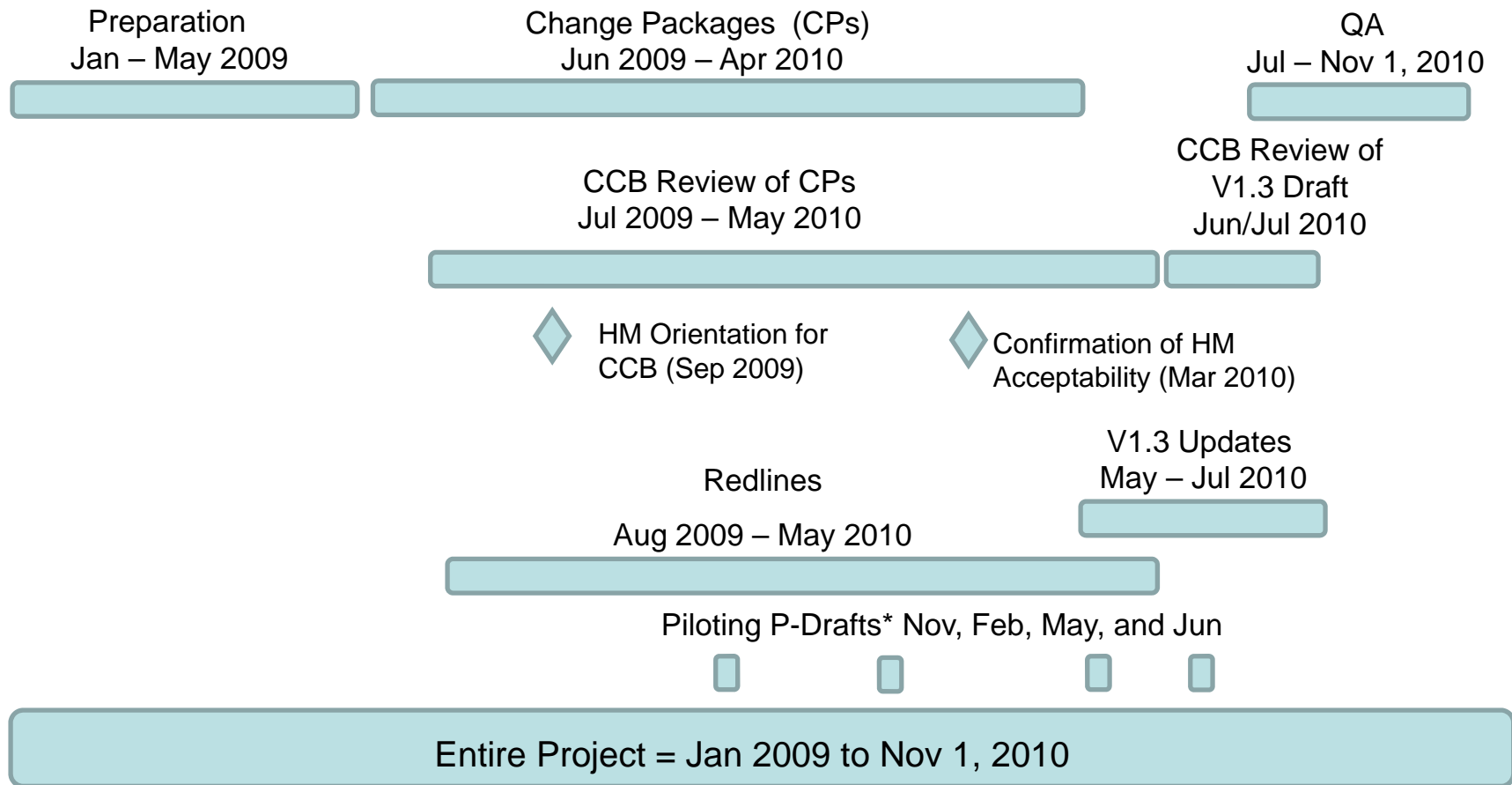
# CMMI

## Planned Elements – Multi-Model

•Improving the interfaces is of interest to both government and industry....



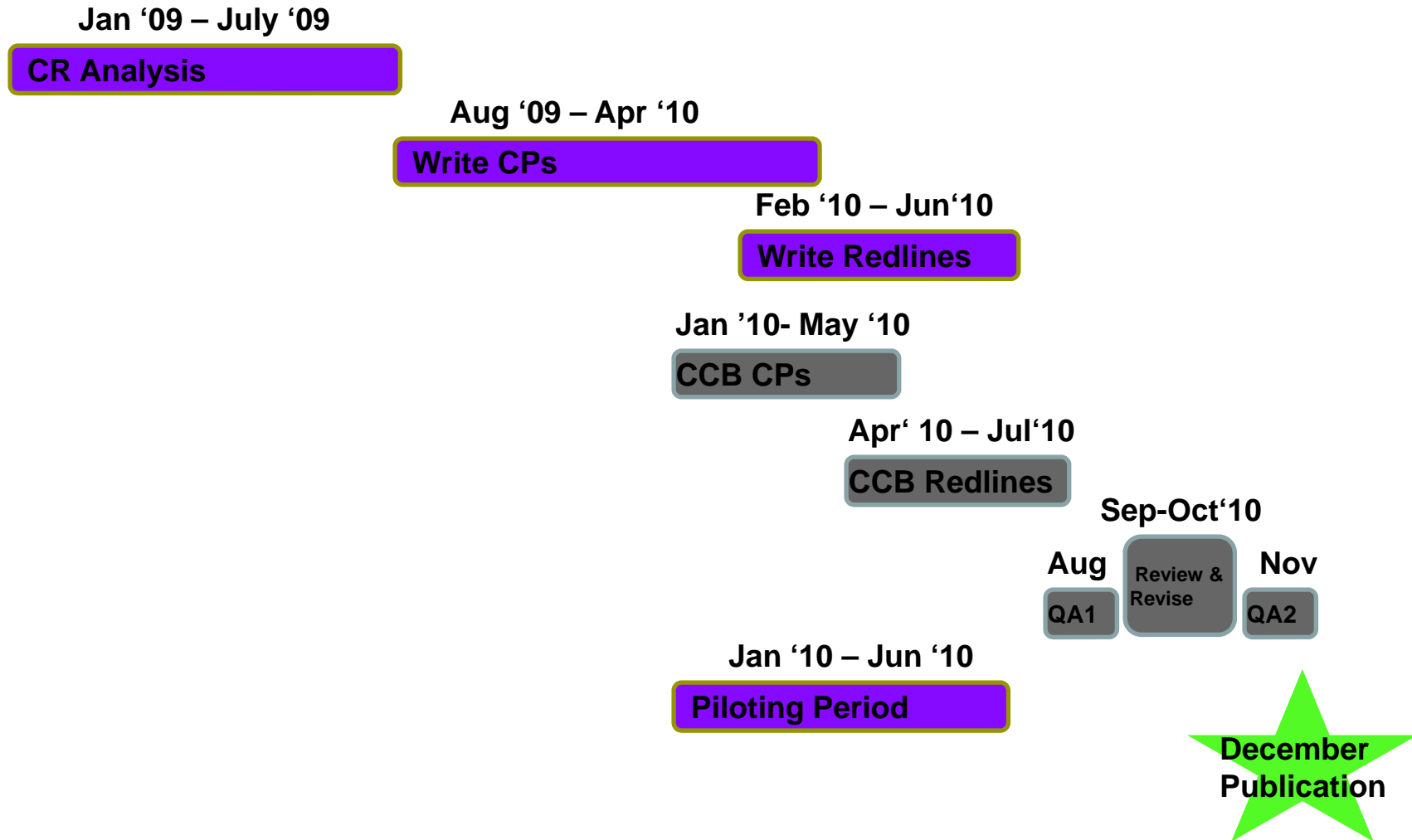
# Schedule for CMMI V1.3 Models



\* Piloting will include candidate solutions for appraising multiple constellations as well as a training approach for CMMI.



# Schedule for CMMI v1.3 Appraisal Products



# CMMI Product Suite, Version 1.3

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Version 1.3 will focus on but not be limited to the following:

- High Maturity
- Appraisal efficiency
- Consistency across constellations
- Simplify the generic practices

Version 1.3 is change request (CR) driven. Events such as this webinar presentation are for information sharing and dialogue.



# Transition...

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We will provide an on-line upgrade course as we did with V1.2.

- Users make the transition by taking the upgrade course.
- Instructors and Lead Appraisers make the transition by taking upgrade course and passing a test.

During a period of one year, organizations may use either V1.2 or V1.3 models for their appraisals.

All appraisals using V1.2 models will be valid for 3 years.





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# Version 1.3 Model Updates



# Model Architecture

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## Typical Work Products

Renamed “typical work product” to be “example work product.” In CMMI-ACQ, “typical supplier deliverable” was renamed to be “example supplier deliverable.”

## Amplifications

Removed the “amplification” model component.

## IPPD/Teaming

Removed the IPPD addition from CMMI-DEV and in its place added teaming practices used in CMMI-ACQ and CMMI-SVC, which are practices that are not optional.



# PA Categories

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## **CMMI-ACQ**

Renamed the “Acquisition” process area category to be “Acquisition Engineering.”

Moved AM and SSAD from the Acquisition PA category to the Project Management PA category.

## **CMMI-DEV**

Moved REQM from the Engineering PA category to the Project Management PA category.



# New Material

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Update selected process areas to provide interpretation of practices for organizations with respect to the following topics:

- Agile methods
- Quality attributes (i.e., non functional requirements or “ilities”)
- Allocation of product capabilities to release increments
- Product lines
- System of systems
- Architecture-centric development practices
- Technology maturation
- Customer satisfaction



# GGs, GPs, and GP Elaborations

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Positioned generic goals, generic practices, and GP elaborations in one central location as the first section of Part 2 in all three models.

Simplified GG1 to make it more readable.

Renamed GP 2.6 to “Control Work Products.”

Added “selected work products” to the GP 2.9 statement.

Simplified the GP 3.2 statement to replace “collect work products, measures, measurement results, and improvement information” with “collect process-related experiences.”

Eliminate GG4 and GG5 (proposed).



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# Version 1.3 Model Updates High Maturity



# Improve Clarity of High Maturity Practices

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Problem statement:

HM practices are currently unclear, leading to a variety of interpretations.

The objective in a nutshell:

All CMMI users have a common understanding of the HM Practices.

Provide clarification on the following:

Process models and process modeling

How business objectives thread to high maturity

Common causes - definition/concentration/expectations at ML5

Defining high maturity expectations on individual PA performance

High maturity re-structuring (including stronger alignment of ML4 & ML5)

Subprocess - selection/definition/level of instantiation



# Establish a Clear Understanding Between Requirements and Expectations

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## Problem statement:

Some people believe that the role of the informative material is being exaggerated in appraisals.

The community has been relying on presentations and published “audit criteria” to better understand and appraise to high maturity.

## The objective in a nutshell:

Document high maturity requirements in high maturity process area goals and high maturity expectations in high maturity process area practices.

## Involves:

Eliminate the need for appraisers and implementers to use high maturity presentations or audit criteria to understand/ implement/ appraise high maturity.





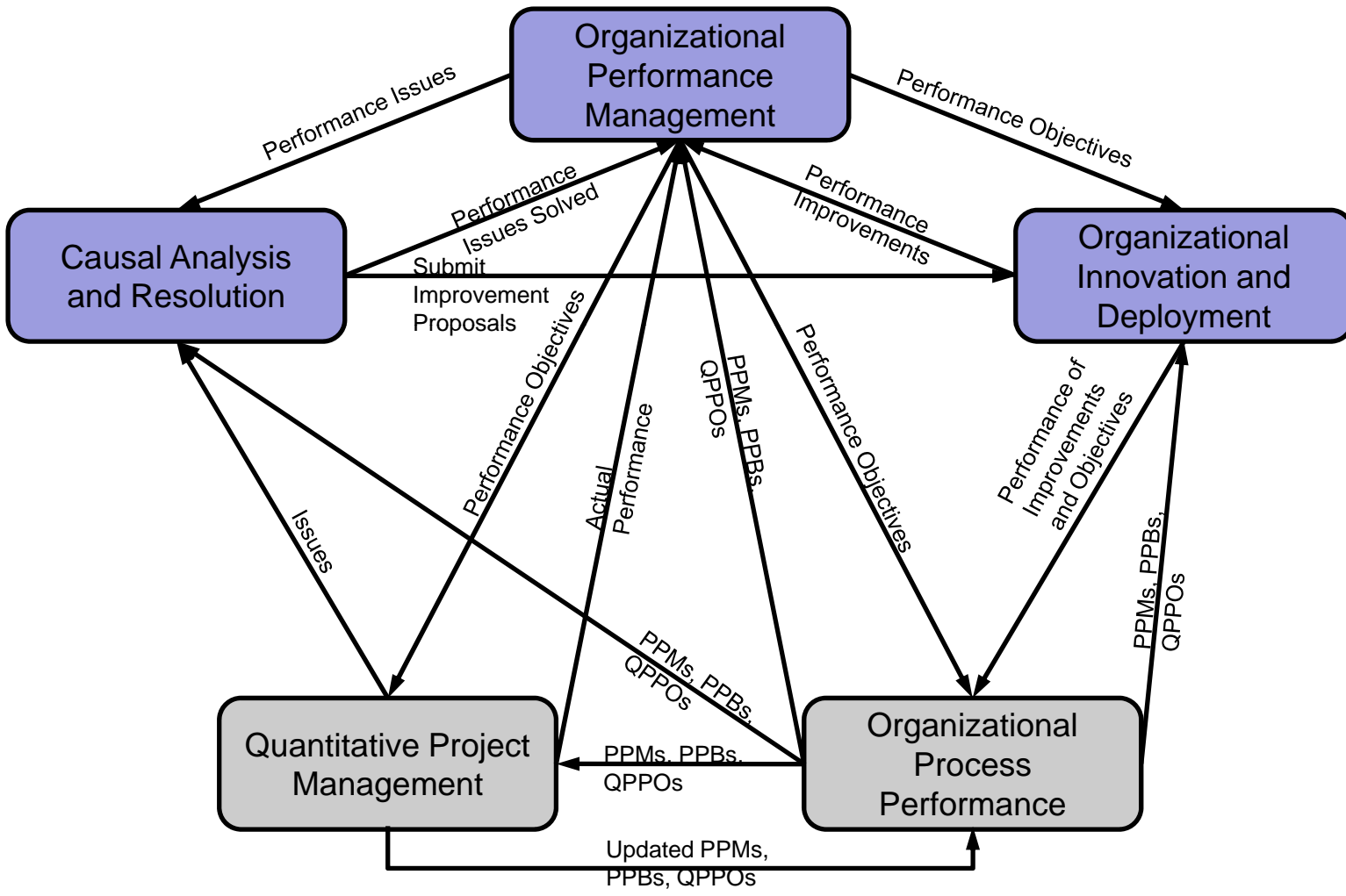
# High Maturity Restructuring

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The restructuring of ML4 and ML5 consists of the following:

- OPP & QPM constitutes ML4.
- Create a new process area called Organization Performance Management (OPM).
- OPM, CAR, & OID constitutes ML5.
- Revised QPM specific practices to reflect a connection between CAR and QPM.





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# Impact on Model Size



# Comparison of Models

Measure	CMMI for Development					CMMI for Acquisition			CMMI for Services	
	V1.1 Staged	V1.1 Cont	V1.2	V1.3 Draft*		V1.2	V1.3 Draft*		V1.2	V1.3 Draft*
Pages	715	710	560	461		428	458		531	527
Process Areas	25	25	22	22*		22	22*		24	24*
Generic Goals	2	5	5	3*		5	3*		5	3*
Generic Practices	12	17	17	13*		17	13*		17	13*
Specific Goals	55	55	50	48*		46	46*		52	52*
Specific Practices	185	189	173	165*		161	161*		182	179*

\* High maturity changes are yet to be finalized.



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# Version 1.3 Appraisal Updates



# Necessary Changes to SCAMPI for V1.3

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Provide SCAMPI support for **each** constellation:

- Potential terminology barriers
- Scoping considerations
- Identifying appropriate pre-requisites for team members

Correct known defects and issues:

- Errors documented during the use of v1.2
- Common pitfalls encountered based on user feedback
- Areas frequently encountered by quality assurance



# Common Themes in the Change Requests<sub>1</sub>

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## Scoping Appraisals

- Confusion caused by “focus-” and “non-focus” projects
- Minimum scoping rules for a wide range of organization types

## Collecting Data

- Confusion caused by “direct” and “indirect” artifacts
- Handling generic practices

## Characterization and Rating

- Issues with characterization rules
- Issues with rating rules



# Common Themes in the Change Requests<sub>2</sub>

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## Pain Points that Make SCAMPI Difficult to Sustain

- Need to achieve efficiency
- Expanding organizational scope
- True cost of PIIDs

## Attaining/Maintaining Appraisal Ratings

- Period of validity
- Maintenance appraisals
- Delta appraisals
- Enterprise appraisals





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# Version 1.3 Training Updates



# Considerations for Training

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We will update the Introduction to CMMI training course to reflect changes in Version 1.3 models.

Deploy a CMMI-SVC three day course

Create a “difference” supplement for DEV



# Summary

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There are four drivers for Version 1.3:

1. Clarify high maturity practices
2. Simplify generic practices
3. Increase appraisal efficiency
4. Improve commonality across the constellations

We appreciate the input you've given us with your change requests!



# What Have We Missed?

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Now let's chat....



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# Version 1.3 Model Details



# CMMI V1.3 Criteria

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Correct identified model, training material, or appraisal method defects or provide enhancements.

Incorporate amplifications and clarifications as needed.

Accommodate potential additions to model coverage (e.g., safety, security, life cycle) only by specific direction of the CMMI Steering Group.

Decrease overall model size in v1.3 if possible; increases, if any, must not be greater than absolutely necessary.

Model and method changes should avoid adversely impacting the legacy investment of adopting companies and organizations.

Changes to model architecture will only be incorporated with specific CMMI Steering Group authorization.

Changes may only be initiated by Change Requests or the CMMI Steering Group.

Editorial changes to training may be released in advance of v1.3.

Changes must not cause retraining of the nearly 100,000 (as of Dec 2008) personnel already trained in CMMI. Upgrade training may be needed, especially for Instructors, Lead Appraisers, and appraisal team members.



# Front Matter

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Clarified that CMMI models are not processes or process descriptions.

Removed any biases favoring maturity levels or capability levels.

Explained that core process areas appear in all CMMI models and that they can have different expected and informative material. For example, PP can have an SP in ACQ that is absent in DEV's PP.

Added information on selecting the right CMMI model for use.



# Glossary

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Differentiated between definitions and usage notes for each glossary entry.

Removed the following terms from the glossary: adequate, alternative practice, amplifications, appropriate, as needed, assessment, assignable cause of process variation, capability evaluation, discipline, functional configuration audit, integrated product and process development, objective, physical configuration audit, and program.

Revised the definitions of “quality” and “corrective action” to be more consistent with ISO definitions of these terms.

Revised the terms “process,” “development,” and “supplier” to be more broadly applicable.

Revised the definition of “supplier agreement” to include agreements within an organization.





# PA Improvements -1

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**CM** – Clarified that CM can apply to hardware, equipment, and other tangible assets.

**DAR** – (1) Included more preparation in the use of DAR practices to help define the scope of alternatives. (2) Added communication of results and rationale to stakeholders.

**IPM** – Simplified SP 1.7 to replace “work products, measures, and documented experiences” with “process-related experiences.”

**IRP** – (1) Reorganized the practices in SG2 and SG3 to be more clear and usable. (2) Updated the terminology to describe “solutions” and “repeatable solutions” in addition to “workarounds,” which are a subset of “repeatable solutions.” (SVC only)

**MA** – (1) Clarified the relationship among information needs and objectives, measurement objectives, and business/project objectives. (2) Added Table 16.1 from CMMI-ACQ to CMMI-DEV and CMMI-SVC.



# PA Improvements -2

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**OT** – Expanded its practices applicability to training development and delivery methods such as self study, mentoring, and online training.

**PI** – (1) Revised the end of the purpose statement from “ensure that the product, as integrated, functions properly, and deliver the product” to “ensure that the product, as integrated, behaves properly (i.e., possesses the required functionality and quality attributes) and deliver the product.” (2) Revised the terminology used from a strong emphasis on “integration sequence” to an emphasis on “integration strategy.” Established a new term, “integration strategy, procedures, and criteria” to use throughout the process area. (3) Revised the SP 1.1 practice to be “Establish and maintain a product integration strategy.” (4) Described what an integration strategy is and how it relates to an integration sequence. (5) Revised the SP 3.2 practice to replace “product integration sequence” with “product integration strategy and procedures.”



# PA Improvements -3

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**PMC** – Clarified that milestone reviews can include project start-up and project close-out.

**PPQA** – Clarified that PPQA practices apply to both project- and organization-level activities and work products.

**RD/ARD** – (1) Added informative material that requirements can be monitored through development based on their criticality to the customer or end user. (2) Revised the terminology used from a strong emphasis on “operational scenarios” to a more balanced “scenarios (operational, sustainment, and development).” (3) Added “quality attributes” as properties of products and services in addition to “functionality,” which resulted in changes to RD SG 3 and SP 3.2.

**REQM** – Changed the focus of SP 1.5 so that it now reads, “Ensure that project plans and work products remain aligned with the requirements.”



# PA Improvements -4

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**SAM** – (1) Clarified the scope of SAM practices' applicability. (2) Demoted the SPs “Evaluate Selected Supplier Work Products” and “Monitor Selected Supplier Processes” to be subpractices of the practice “Accept the Acquired Product.” (3) Added the concept “products and processes of significant value to the project” to help determine what to monitor. (4) Revised the practice “Ensure Transition of Products” to allow its applicability to times when the product or service is delivered directly to the customer or end user from the supplier. (SVC and DEV only)

**SCON** – Revised the practice title and statement of SP 3.3 to clarify that verification and validation apply to the service continuity plan. (SVC only)

**SSAD** – Added informative material about using preferred suppliers. (ACQ only)

**SSD** – Revised SP 1.3 to include “quality attributes” as well as “functionality” when analyzing and validating requirements. (SVC only)



# High Maturity Issues

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Terminology Confusion

Requirements implied versus explicit

Explanations not central or consistent

Model/ Audit Criteria/ Presentations (Healthy Ingredients)/ UCHMP

Perceptions

Customers – ML 5 is expensive – no better than 3

Industry – ML 5 is NOT RIGHT for every business

High Maturity in ALL constellations

Examples are focused on Development



# Terminology: Common Cause

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## Problem

Change requests indicate that SPC concepts, and “Common Cause” in particular, are over-emphasized and applied inappropriately in the model.

## Resolution

Differentiate ML 4&5 in a more robust way – without relying on SPC concepts as THE central theme.

Balance the treatment of Assignable/Common Cause in Quantitative Project Management process area to allow a greater variety of quantitative techniques to be recognized.

Revise glossary entries and other related terminology throughout the model to avoid narrowly focusing on ‘Common Cause’ as a defining concept of high maturity.



# Terminology: Process Models and Process Modeling

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## Problem

The definition of the term process performance model (PPM) is not understood

The way in which process performance models are established, including whether they established only by the organization, is not understood

The use of process performance models for process and project management, and process improvement is not understood

## Resolution

Revise the glossary definition of PPM to clearly state the required characteristics based on selected parts of the High Maturity redlines and “healthy ingredients”

For establishing PPMs: (1) Add informative material to QPM and OPP stating that PPMs and PPBs can be created by the organization, projects or support groups. (2) Revise the informative material to show the use of data from stabilized subprocesses is desirable, but not required, not all parameters in a PPM must be related to characteristics of a sub-process

Add informative material to QPM, CAR, and OID to describe the use of PPMs



# Terminology: Business Objectives

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## Problem

The importance of using business objectives to drive High Maturity activities at both an organization and project level is not understood.

The relationship between organizational quality and process performance objectives and project quality and process performance objectives is not well understood.

## Resolution

Add informative material to OPP and QPM to clarify proper use of business objectives, including updated examples.





# Terminology: Subprocesses

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## Problem

The term subprocesses is not well understood.

There is confusion about relationship between subprocesses and baselines and models.

The selection and use of subprocesses is not well understood.

## Resolution

Add informative material to OPP and QPM to clarify use of subprocesses, including updated examples.



# Other Terminology...

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Used “team” instead of “integrated team” in most cases when discussing teaming practices.

Simplified phrases such as “work products, measures, and improvement information” with simpler expressions such as the word “experiences.”

Revised the terminology in engineering-related material from a strong emphasis on “functionality” to a more balanced “behavior (functionality and quality attributes)” or simply “functionality and quality attributes.”

Clarified whether the use of “lifecycle” refers to a project lifecycle, product lifecycle, or both throughout the model.

Involved the CMMI Translation Team during model development work to identify and resolve translations issues.

Replaced the word “project” with other terms where needed. (SVC only)

