Carnegie Mellon
Software Engineering Institute

Pittsburgh, PA 15213-3890

CMMI® Version 1.2 and Beyond

NDIA CMMI Technology Conference
November 13, 2006

Mike Phillips
Software Engineering Institute
Carnegie Mellon University

Thanks to Gary Wolf and D'Ann Hunt from Raytheon, Denise Cattan of SPIRULA

CMMI Today

Selected CMMI® Data (FY06)

17,630 Trained in Introduction to CMMI

Net increase of:

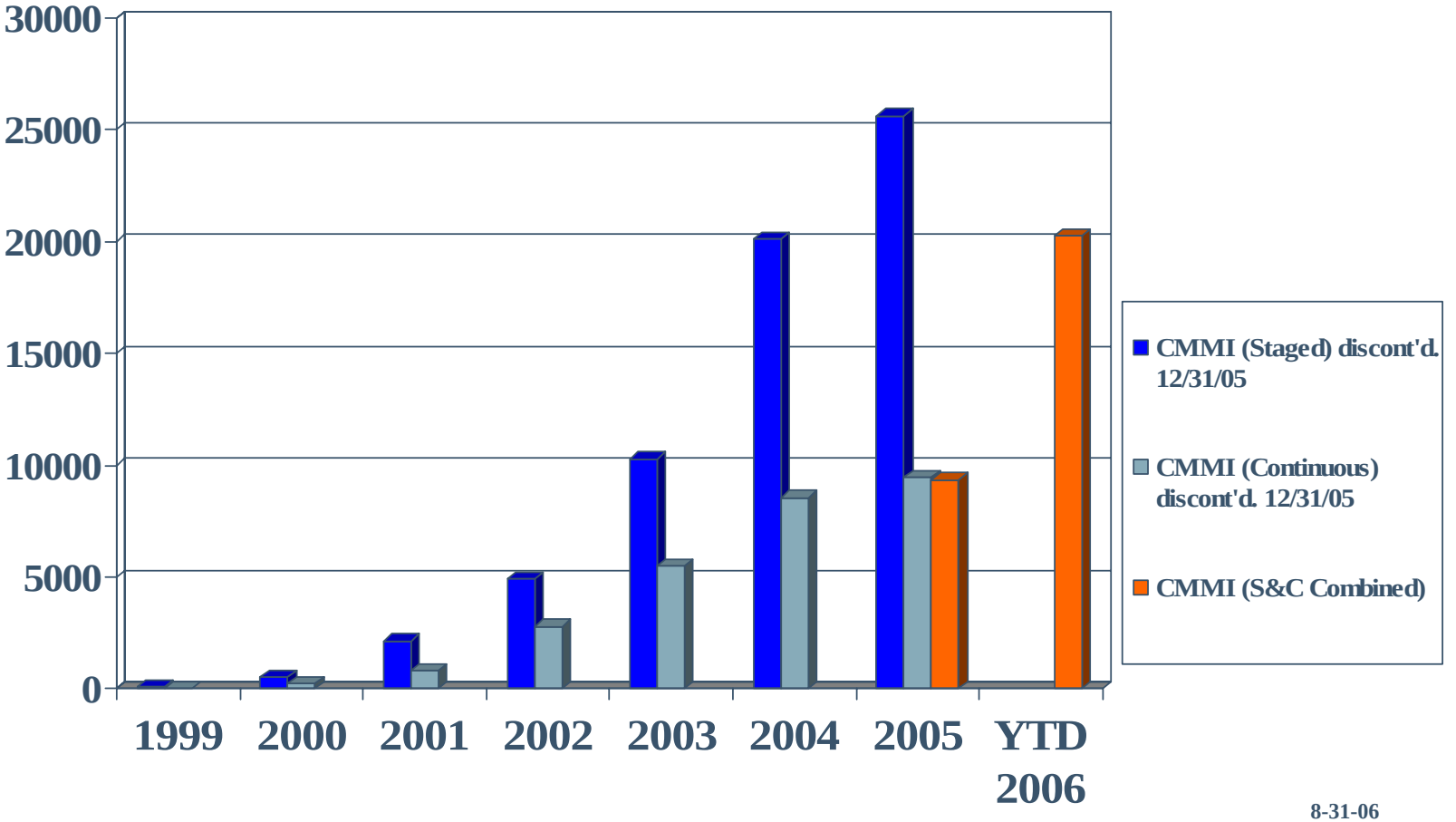
-108 Authorized Introduction to CMMI Instructors

- 45 Authorized SCAMPI Lead Appraisers
- 84 Authorized SCAMPI B/C Team Leads

744 SCAMPI V1.1 Class A Appraisals conducted and reported to the SEI

417 Publicly Reported SCAMPI V1.1 Class A Appraisals on the SEI Web Site

Number of CMMI Students Trained (Cumulative)



Transition from V1.1 to V1.2 Status - 10-12-06

Introduction to CMMI Students
- Registered for Upgrade Training – 464
- Upgrades Complete – 190

Lead Appraisers and Instructors
- Registered for Upgrade Training – 561
- Upgrade Training Complete – 256
- Exams
  - Passed – 159
  - Failed (and not yet retaken) – 7

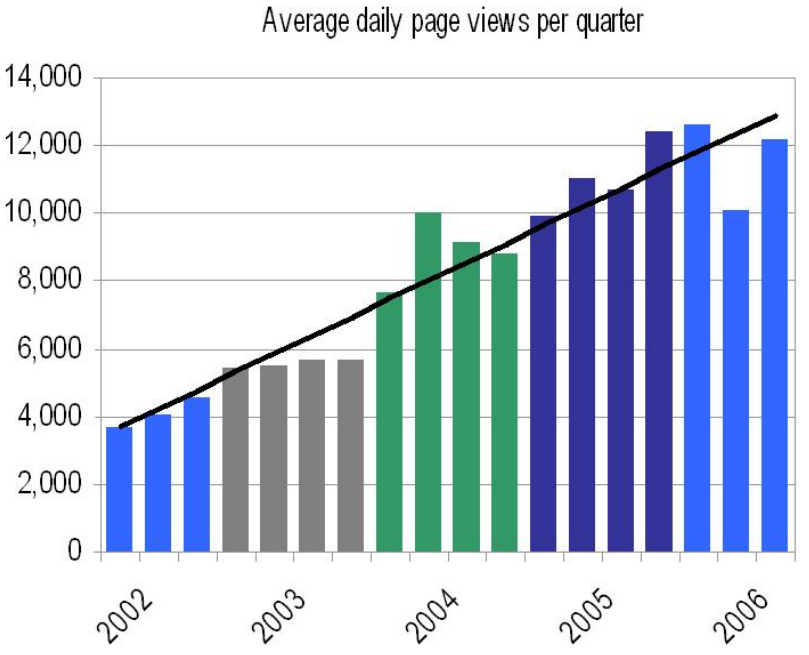
CMMI Adoption Trends

CMMI Web pages views in September 2006

- 360K/month
- Exceeded 24K/day

The following were the most downloaded files on the SEI Web site in September 2006:

- CMMI-DEV, V1.2 (PDF Version)
- CMMI V1.1 Overview Presentation
- CMMI V1.2 Overview Presentation
- CMMI-DEV, V1.2 (Word Version)
- CMMI V1.2 Model Changes Presentation



CMMI Transition Status – 10/31/06

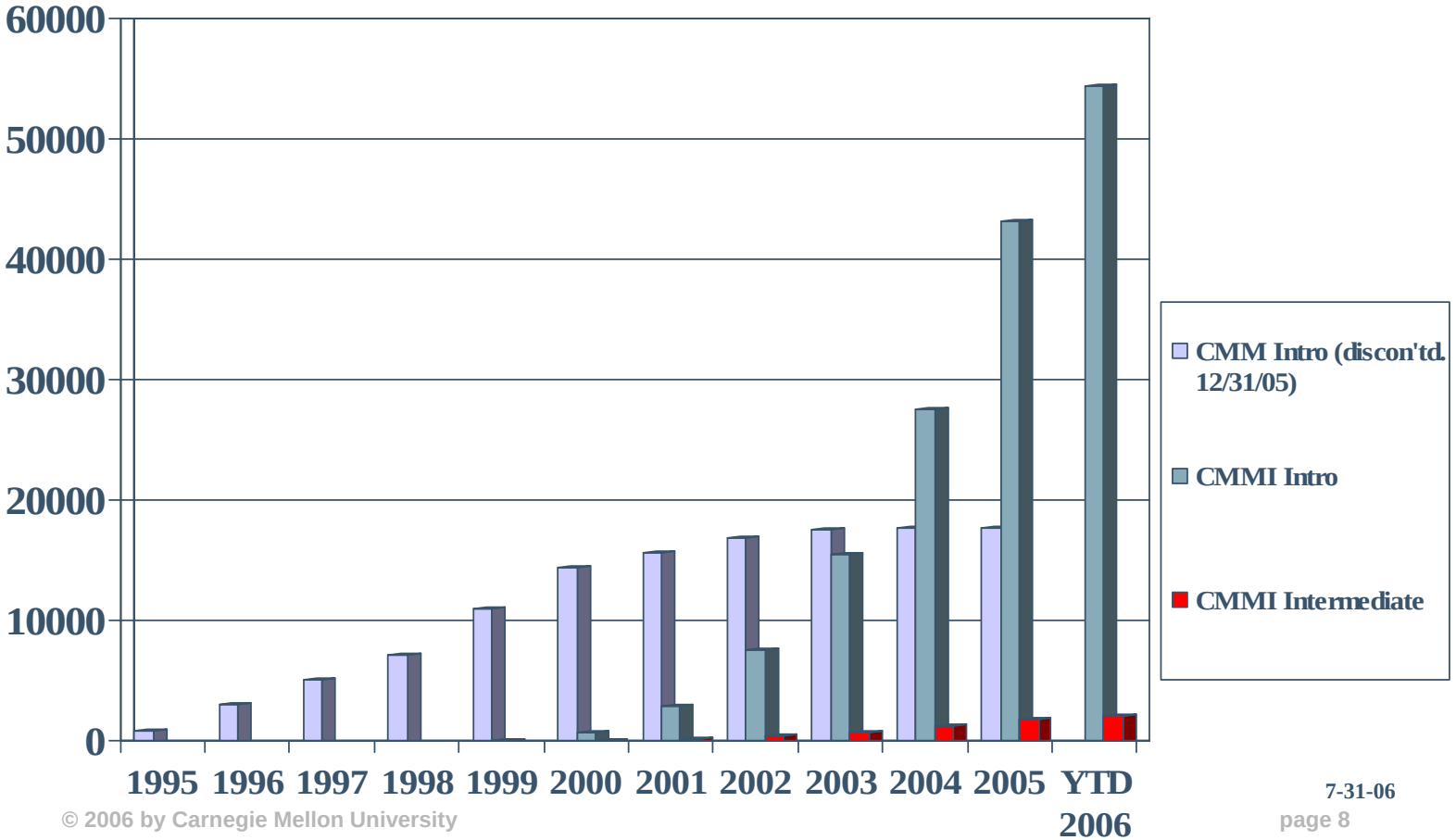
Training

- Introduction to CMMI – 58,178 trained
- Intermediate CMMI – 2,280 trained
- Introduction to CMMI Instructors – 449
- SCAMPI Lead Appraisers – 630 trained
- SCAMPI B&C-Only Team Lead -- 33

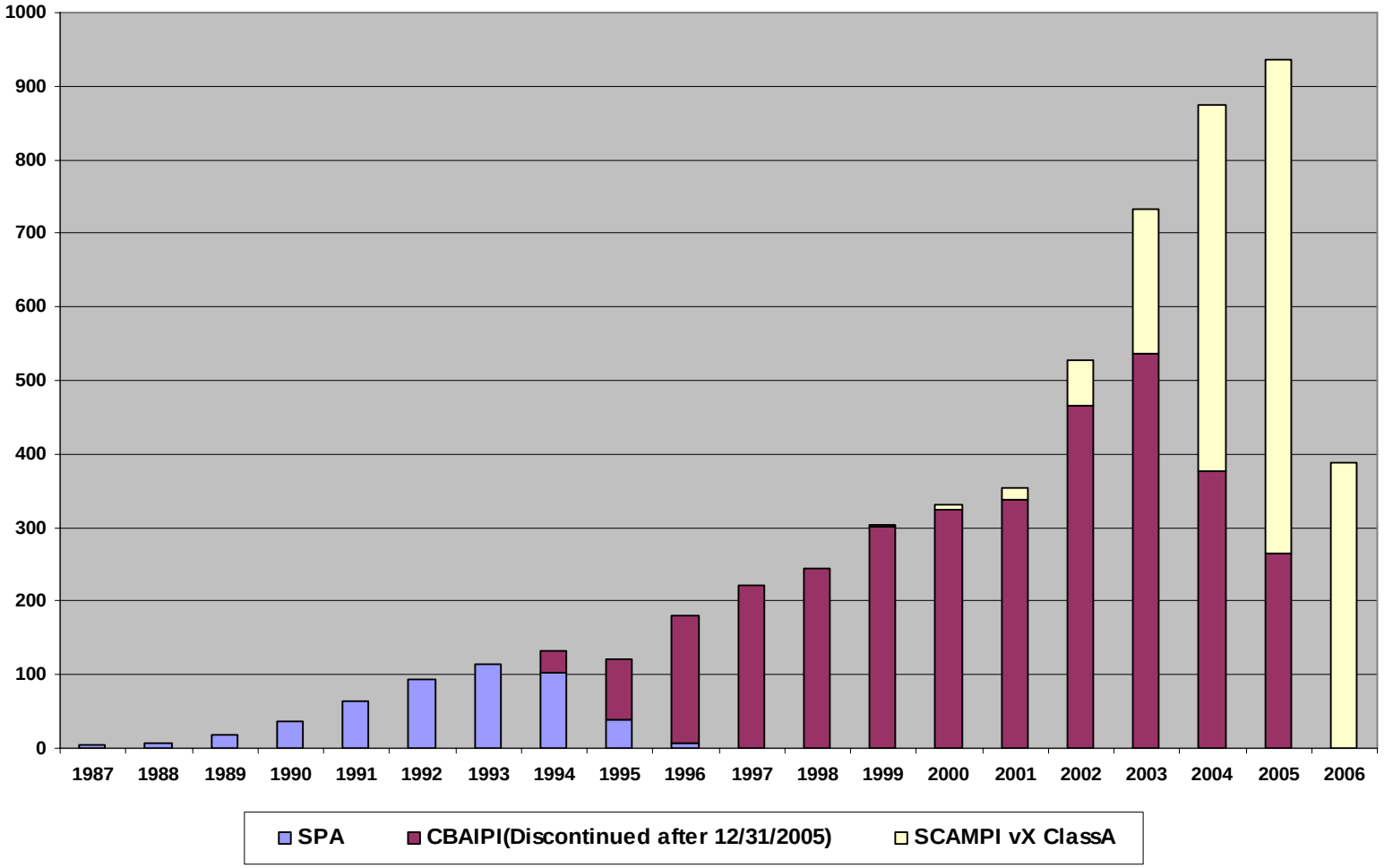
Authorized

- Introduction to CMMI V1.1 Instructors – 404
- SCAMPI V1.1 Lead Appraisers – 451
- SCAMPI B&C Team Leads -- 432

Intro to the CMM and CMMI Attendees (Cumulative)



Number of Appraisals Conducted by Year
Reported as of 31 August 2006



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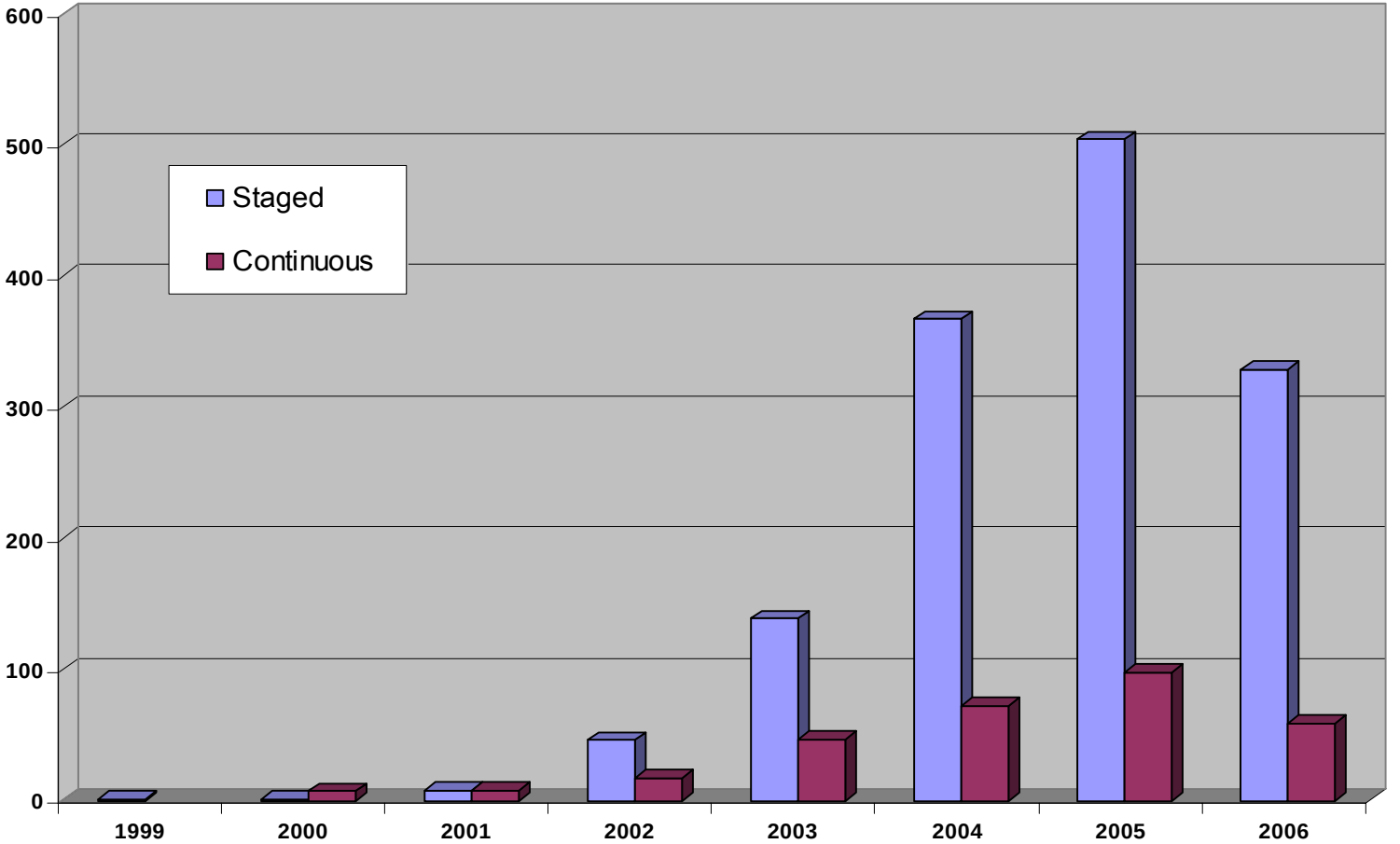
Number of SCAMPI vX Class A Appraisals Conducted by Year by Model Representation*
Reported as of 31 August 2006
*Where Representation is reported



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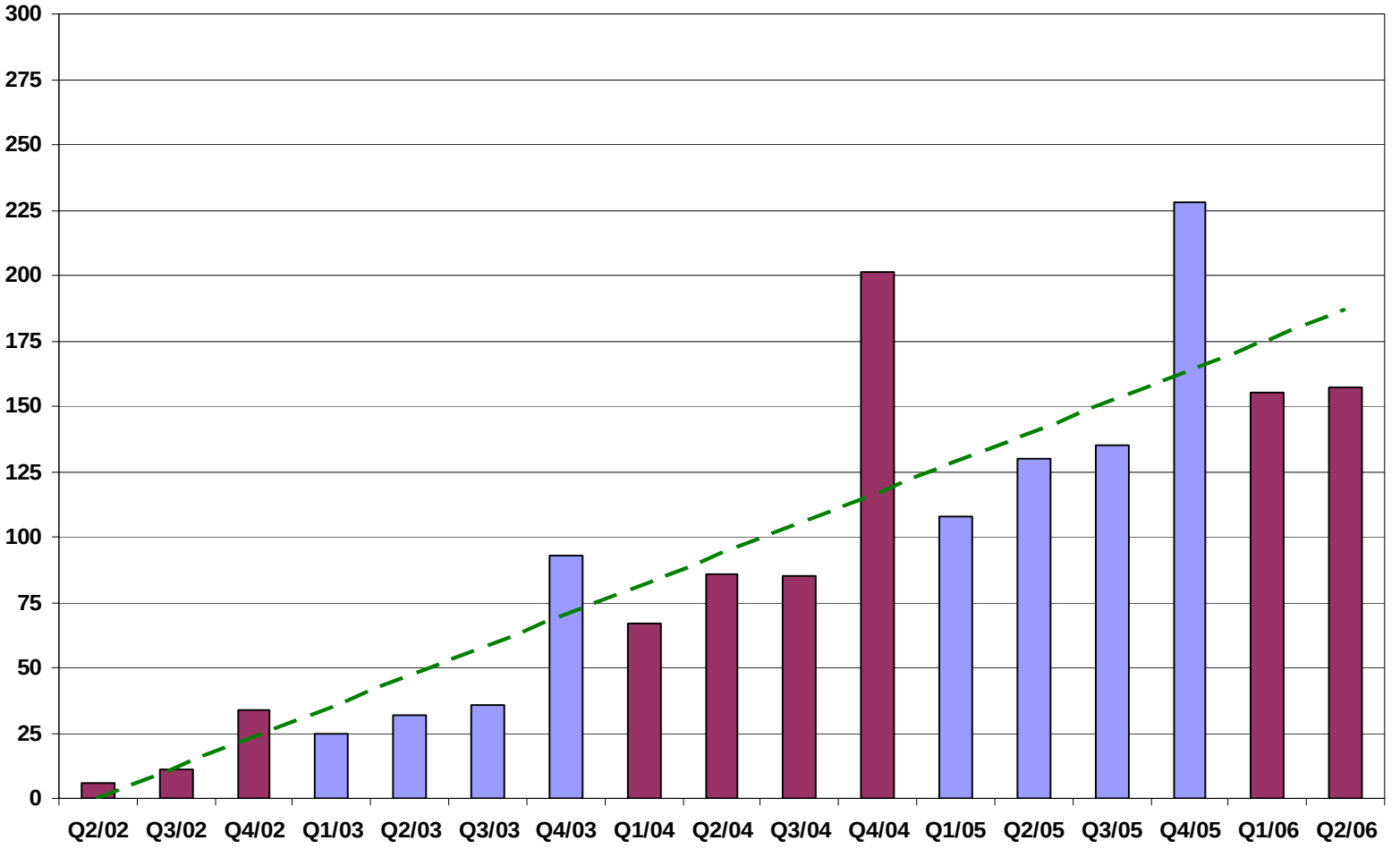
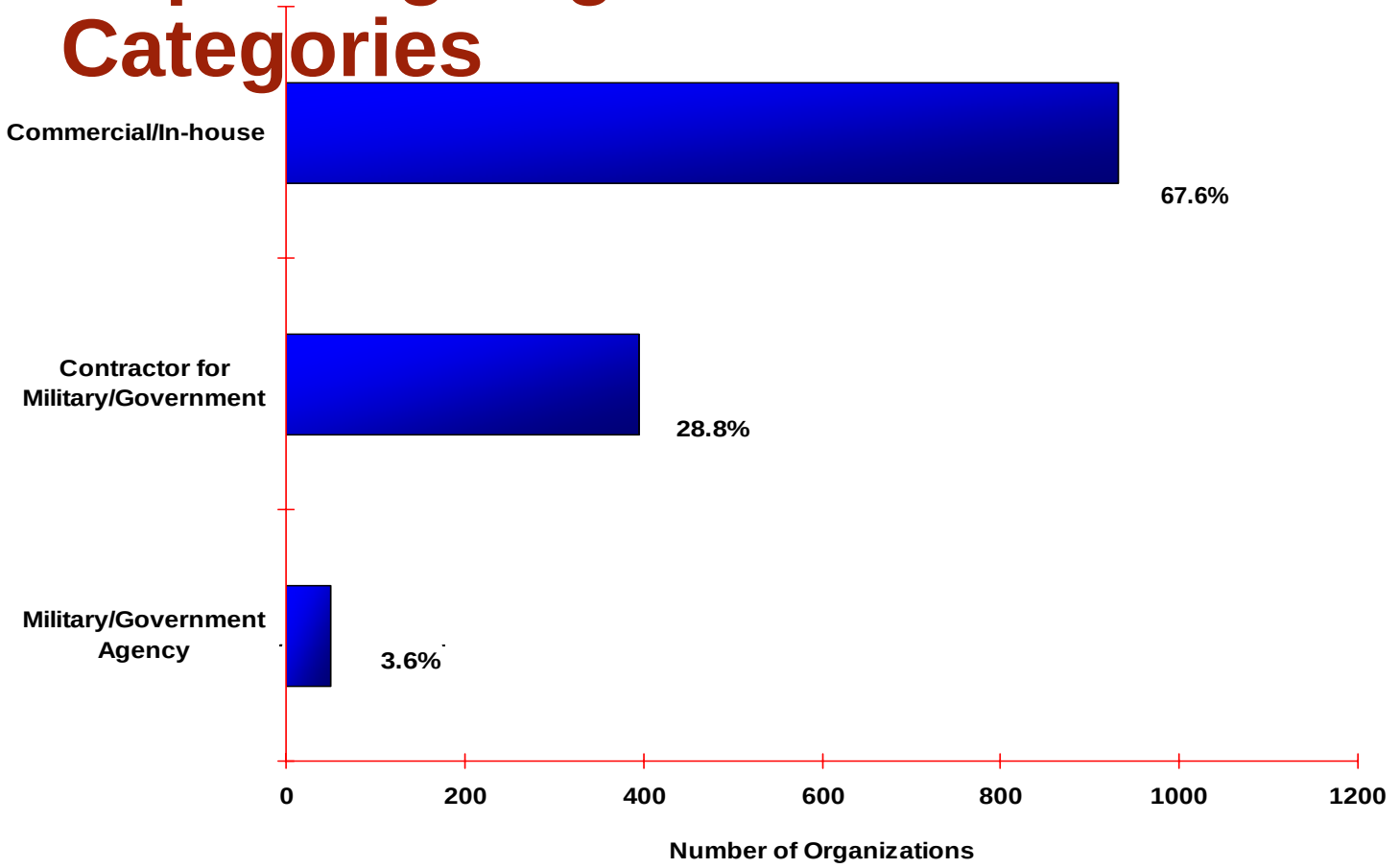
Number of SCAMPI v1.1 Class A Appraisals Conducted by Quarter
Reported as of 31 August 2006



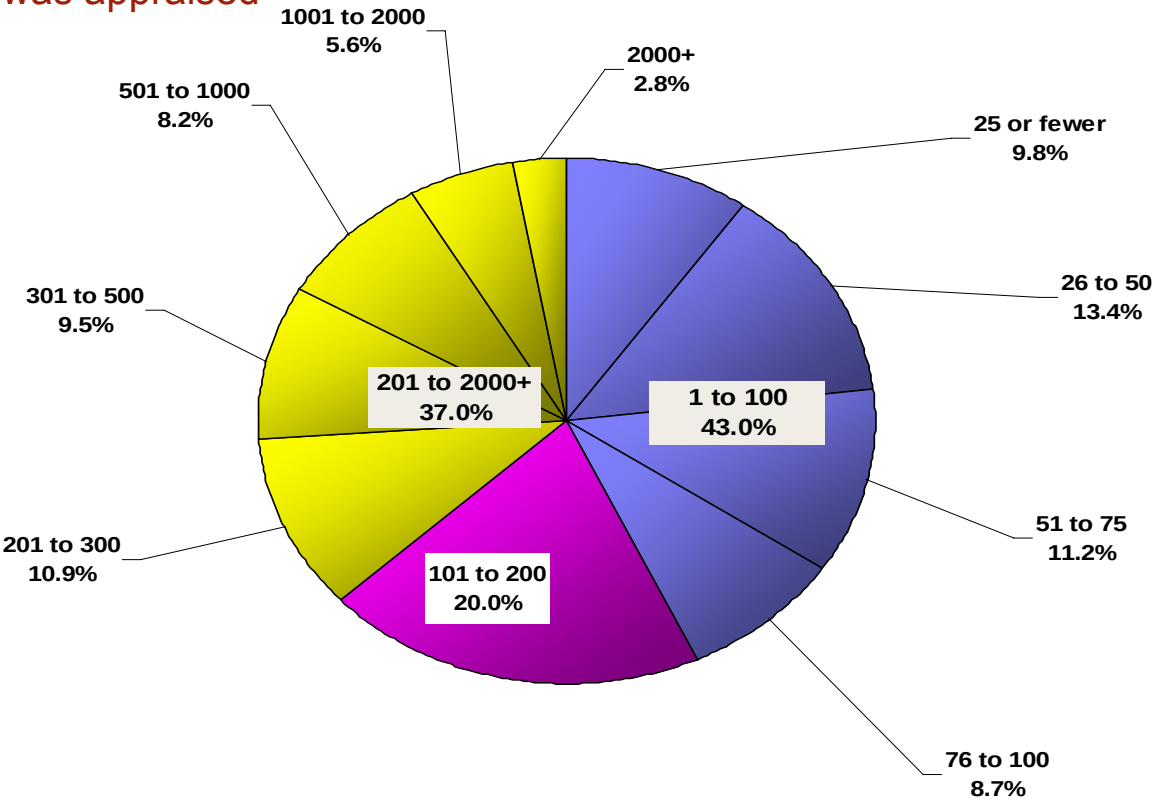
Reporting Organizational Categories



Based on **1,377** organizations

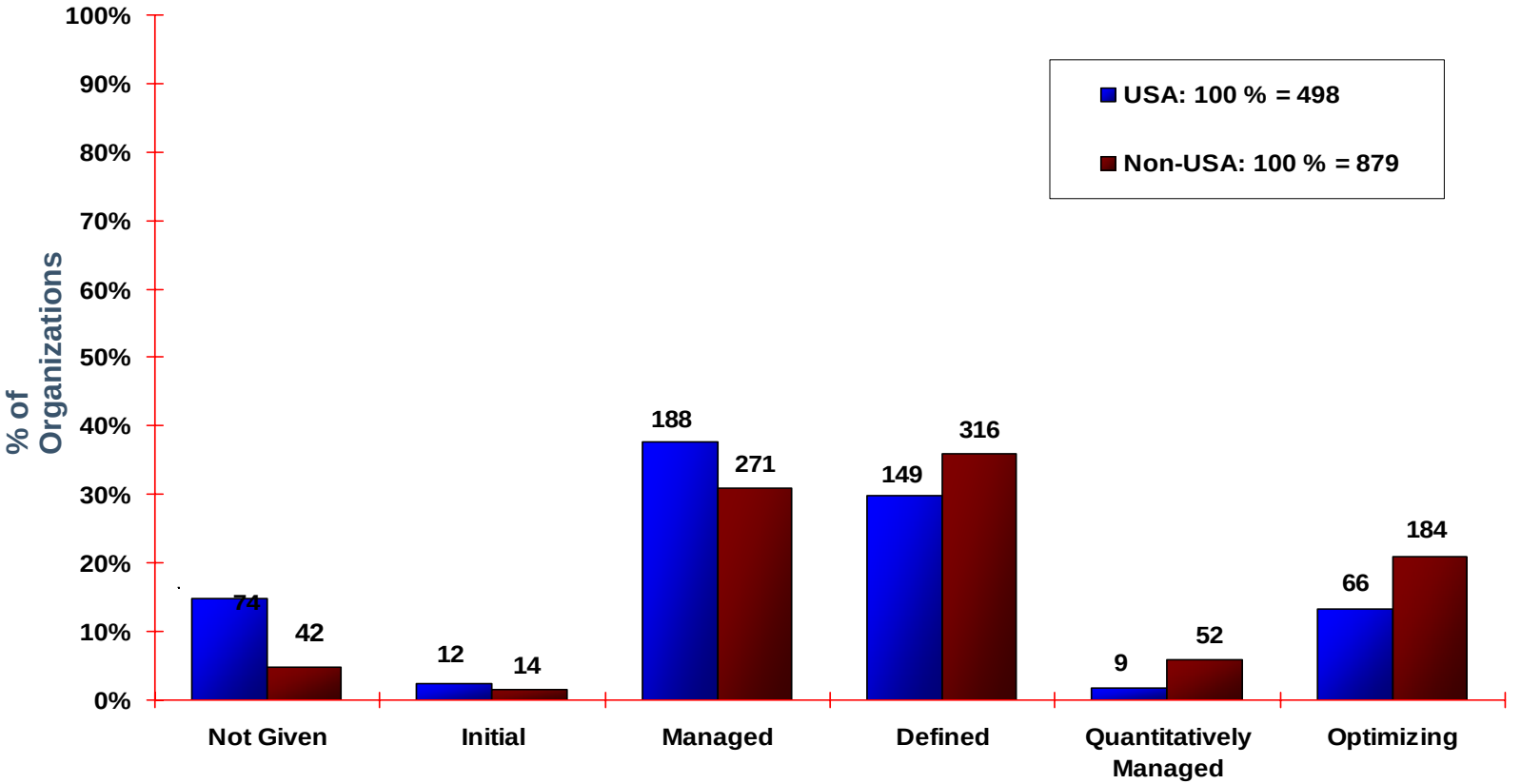
Organization Size

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



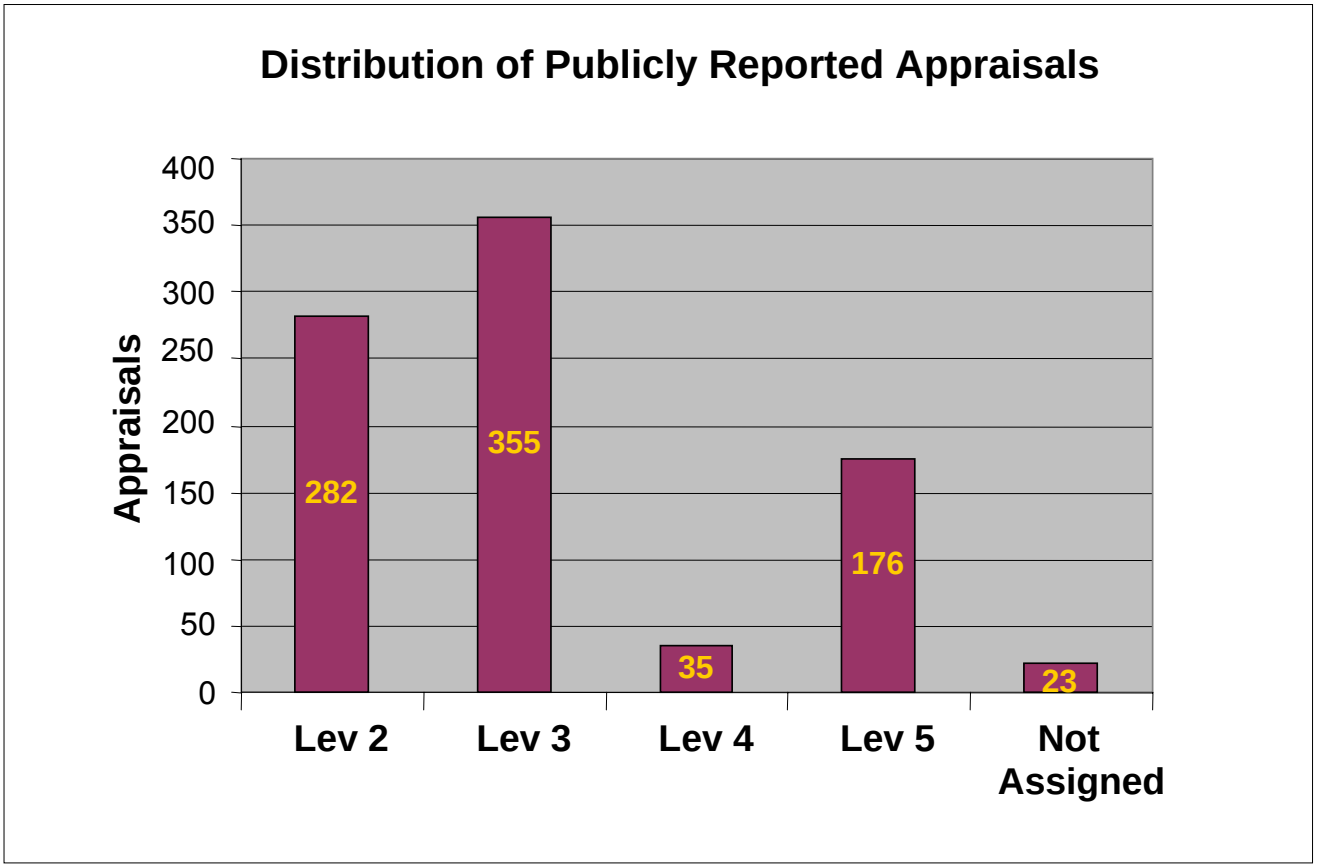
Based on **1,348** organizations reporting size data

Maturity Profile by All Reporting USA and Non-USA Organizations

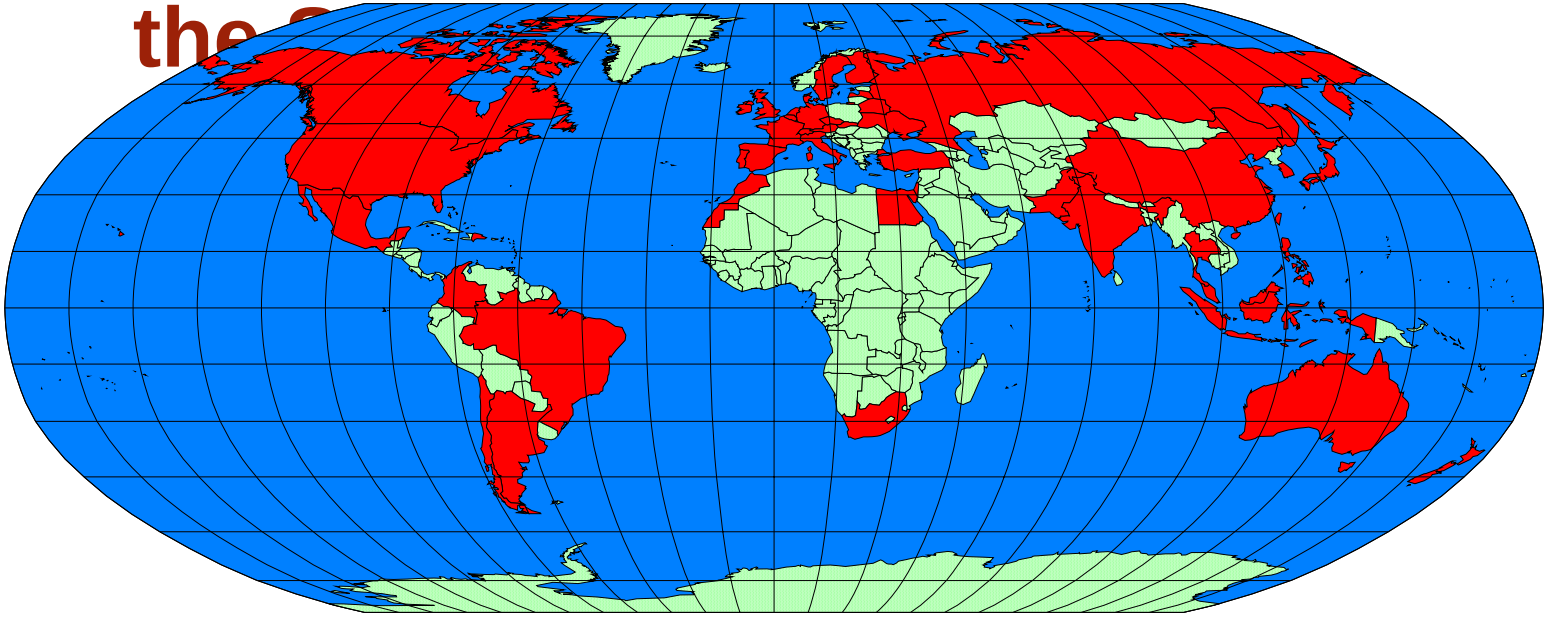


Based on **498** USA organizations and **879** Non-USA organizations

Publicly Reported SCAMPI V1.1 Class A Appraisals – 9/30/06



Countries where Appraisals have been Performed and Reported to the S



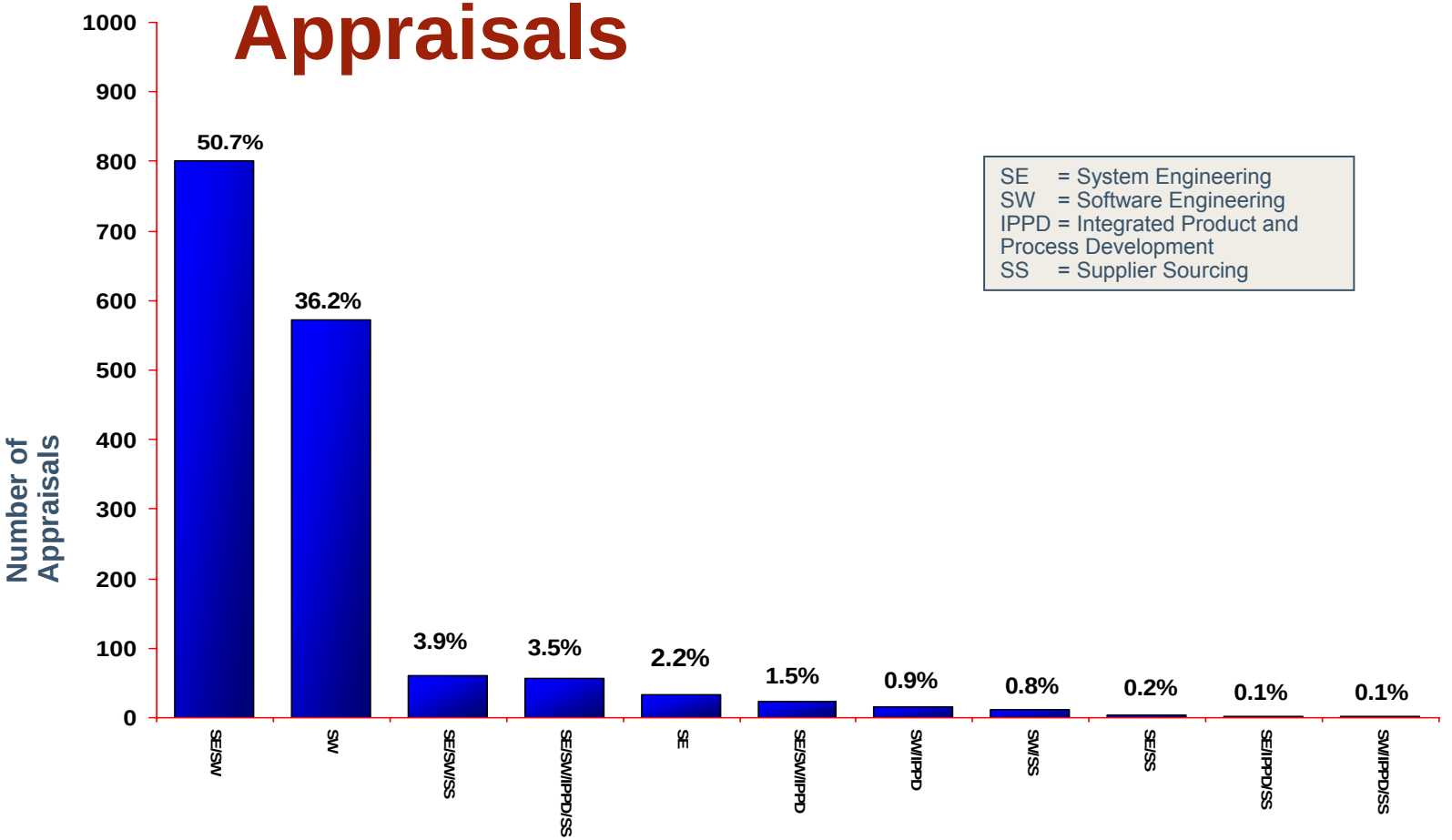
Argentina	Australia	Austria	Bahrain	Belarus	Belgium	Brazil	Canada
Chile	China	Colombia	Czech Republic	Denmark	Dominican Republic	Egypt	Finland
France	Germany	Hong Kong	India	Indonesia	Ireland	Israel	Italy
Japan	Korea, Republic of	Latvia	Malaysia	Mauritius	Mexico	Morocco	Netherlands
New Zealand	Pakistan	Philippines	Portugal	Russia	Singapore	Slovakia	South Africa
Spain	Sweden	Switzerland	Taiwan	Thailand	Turkey	Ukraine	United Kingdom
United States	Vietnam						

Red country name: New additions with this reporting

Number of Appraisals and Maturity Levels Reported to the SEI by Country

Country	Number of Appraisals	Maturity Level 1 Reported	Maturity Level 2 Reported	Maturity Level 3 Reported	Maturity Level 4 Reported	Maturity Level 5 Reported	Country	Number of Appraisals	Maturity Level 1 Reported	Maturity Level 2 Reported	Maturity Level 3 Reported	Maturity Level 4 Reported	Maturity Level 5 Reported
Argentina	15	No	Yes	Yes	Yes	Yes	Korea, Republic of	56	Yes	Yes	Yes	Yes	Yes
Australia	23	Yes	Yes	Yes	Yes	Yes	Latvia	10 or fewer					
Austria	10 or fewer						Malaysia	15	No	No	Yes	No	Yes
Bahrain	10 or fewer						Mauritius	10 or fewer					
Belarus	10 or fewer						Mexico	10 or fewer					
Belgium	10 or fewer						Morocco	10 or fewer					
Brazil	39	No	Yes	Yes	Yes	Yes	Netherlands	10 or fewer					
Canada	18	No	Yes	Yes	No	Yes	New Zealand	10 or fewer					
Chile	10 or fewer						Pakistan	10 or fewer					
China	158	Yes	Yes	Yes	Yes	Yes	Philippines	14	No	Yes	Yes	No	Yes
Colombia	10 or fewer						Portugal	10 or fewer					
Czech Republic	10 or fewer						Russia	10 or fewer					
Denmark	10 or fewer						Singapore	10 or fewer					
Dominican Republic	10 or fewer						Slovakia	10 or fewer					
Egypt	10						South Africa	10 or fewer					
Finland	10 or fewer						Spain	25	No	Yes	Yes	No	Yes
France	65	Yes	Yes	Yes	Yes	Yes	Sweden	10 or fewer					
Germany	28	Yes	Yes	Yes	Yes	Yes	Switzerland	10 or fewer					
Hong Kong	10 or fewer						Taiwan	31	No	Yes	Yes	No	No
India	177	No	Yes	Yes	Yes	Yes	Thailand	10 or fewer					
Indonesia	10 or fewer						Turkey	10 or fewer					
Ireland	10 or fewer						Ukraine	10 or fewer					
Israel	10 or fewer						United Kingdom	42	Yes	Yes	Yes	Yes	No
Italy	10 or fewer						United States	598	Yes	Yes	Yes	Yes	Yes
Japan	155	Yes	Yes	Yes	Yes	Yes	Vietnam	10 or fewer					

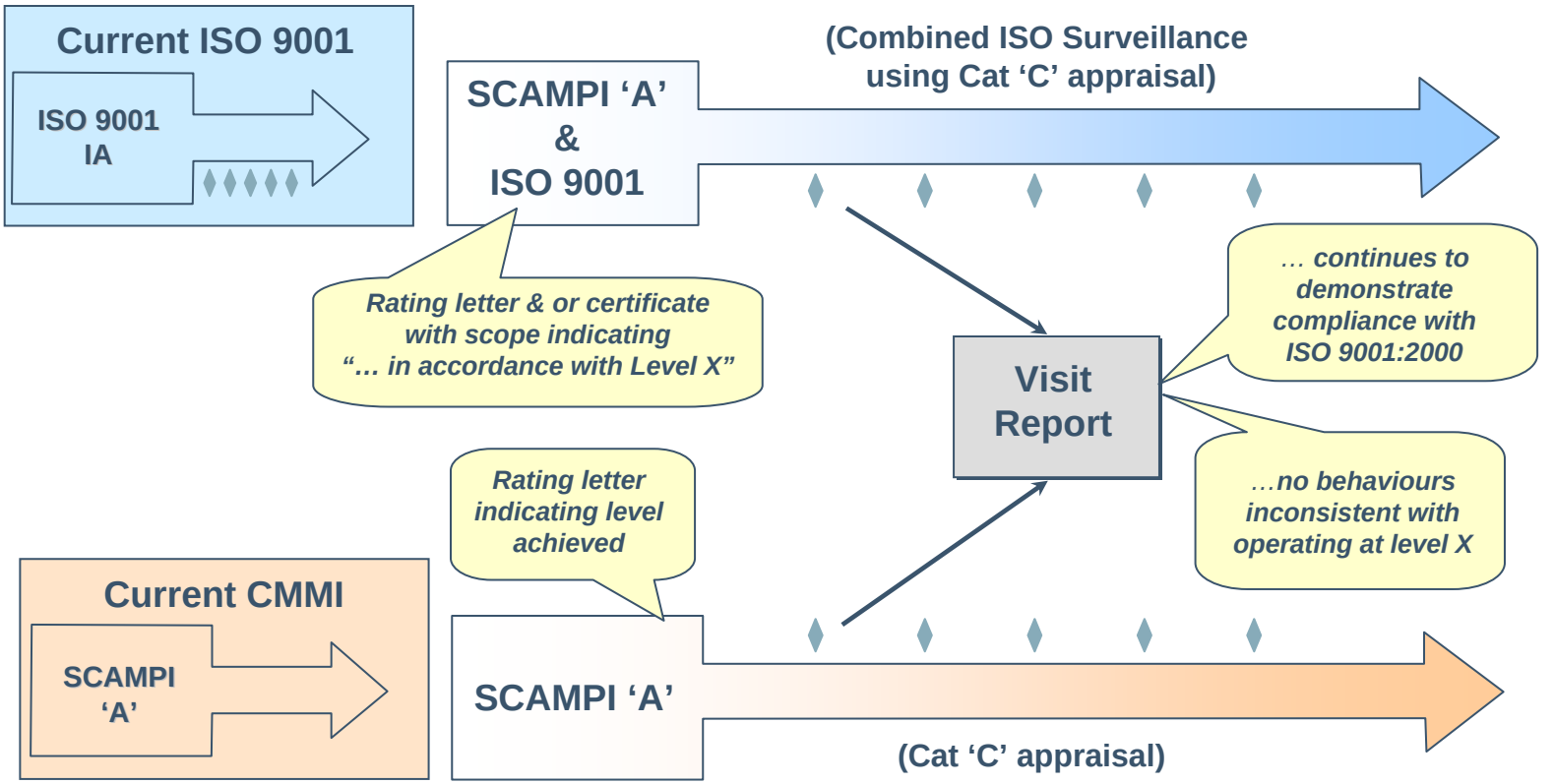
Disciplines Selected for Appraisals



Based on **1,581** appraisals

For more information about Allowable Models & Combinations, visit: http://www.sei.cmu.edu/cmmi/background/aspec.html

Combined Appraisal Opportunities

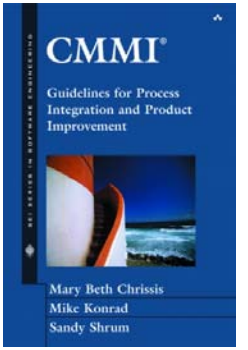


The possible options for assessment and surveillance

Adoption: What Else Is Happening?

The Addison-Wesley SEI Series Book and:

- A Guide to the CMMI
- CMMI: A Framework…
- CMMI Assessments
- CMMI Distilled: Second Edition
- CMMI SCAMPI Distilled
- CMMI: Un Itinéraire Fléché
- De kleine CMMI
- Interpreting the CMMI
- Making Process Improvement Work
- Practical Insight into CMMI
- CMMI Survival Guide
- Real Process Improvement Using the CMMI
- Systematic Process Improvement Using ISO 9001:2000 and CMMI
- Balancing Agility and Discipline



How about SEI Publications?

Technical notes and special reports:

- Interpreting CMMI:
  - for Operational Organizations
  - for COTS Based Systems
  - for Service Organizations
  - for Marketing (in progress)
- Using CMMI with:
  - Earned Value Management
  - Product Line Practices
  - Six Sigma
- Supplementing CMMI for Safety Critical Development (in progress)
- Demonstrating the Impact and Benefits of CMMI (and web pages – www.sei.cmu.edu/cmmi/results)

Performance Results Summary

Improvements	Median	# of data points	Low	High
Cost	34%	29	3%	87%
Schedule	50%	22	2%	95%
Productivity	61%	20	11%	329%
Quality	48%	34	2%	132%
Customer Satisfaction	14%	7	-4%	55%
Return on Investment	4.0 : 1	22	1.7 : 1	27.7 : 1

- N = 30, as of August 2006
- Organizations with results expressed as change over time

CMMI Today

Version 1.1 CMMI Product Suite was released January 2002.

- **CMMI Web site visits average over 12,000/day**
- **Over 58,000 people have been trained**
- **Almost 1600 “class A” appraisals have been reported to the SEI**

Now we want to continuously improve…

CMMI V1.2…and Beyond

Major Themes

Reduce complexity & size

Increase coverage

Increase confidence in appraisal results

Reduced Model Complexity & Size

Eliminated the concepts of advanced practices and common features

Incorporated ISM into SAM; eliminated Supplier Sourcing (SS) addition

Consolidated and simplified the IPPD material

All definitions consolidated in the glossary

Adopted a single book approach (i.e., will no longer provide separate development models)

Report size reduced 15% from either predecessor; PAs reduced 12%

Increased Model Coverage

Added hardware amplifications

Added two work environment practices (i.e., one in OPD and one in IPM)

Added goal and two practices in OPF to emphasize importance of project startup

Updated notes (including examples) where appropriate so that they also address service development and acquisition of critical elements

Updated name to CMMI for Development (CMMI-DEV) to reflect the expanded coverage

Model Changes - Other

Improved the Overview section (Part One)

Improved clarity of how GPs are used

- Moved generic goals and practices to Part Two
- Added explanation of how process areas support the implementation of GPs
- Added GP elaborations for GP 3.2

Improved the glossary (e.g., higher level management, bidirectional traceability, subprocess)

Limited the process areas that can be considered "not applicable" to SAM.

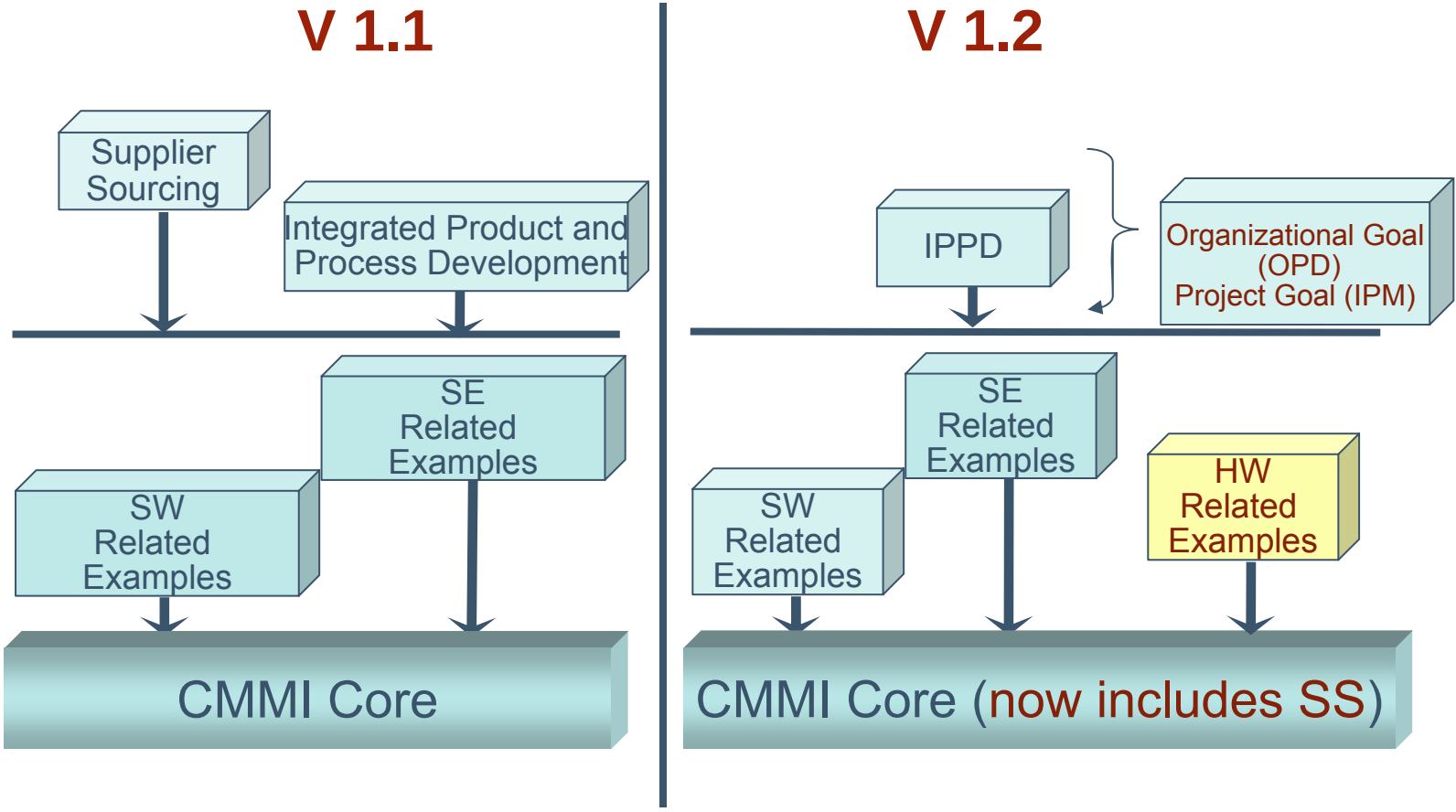
Clarified material throughout the model based on over 1000 change requests

Integrated Product and Process Development (IPPD) Changes

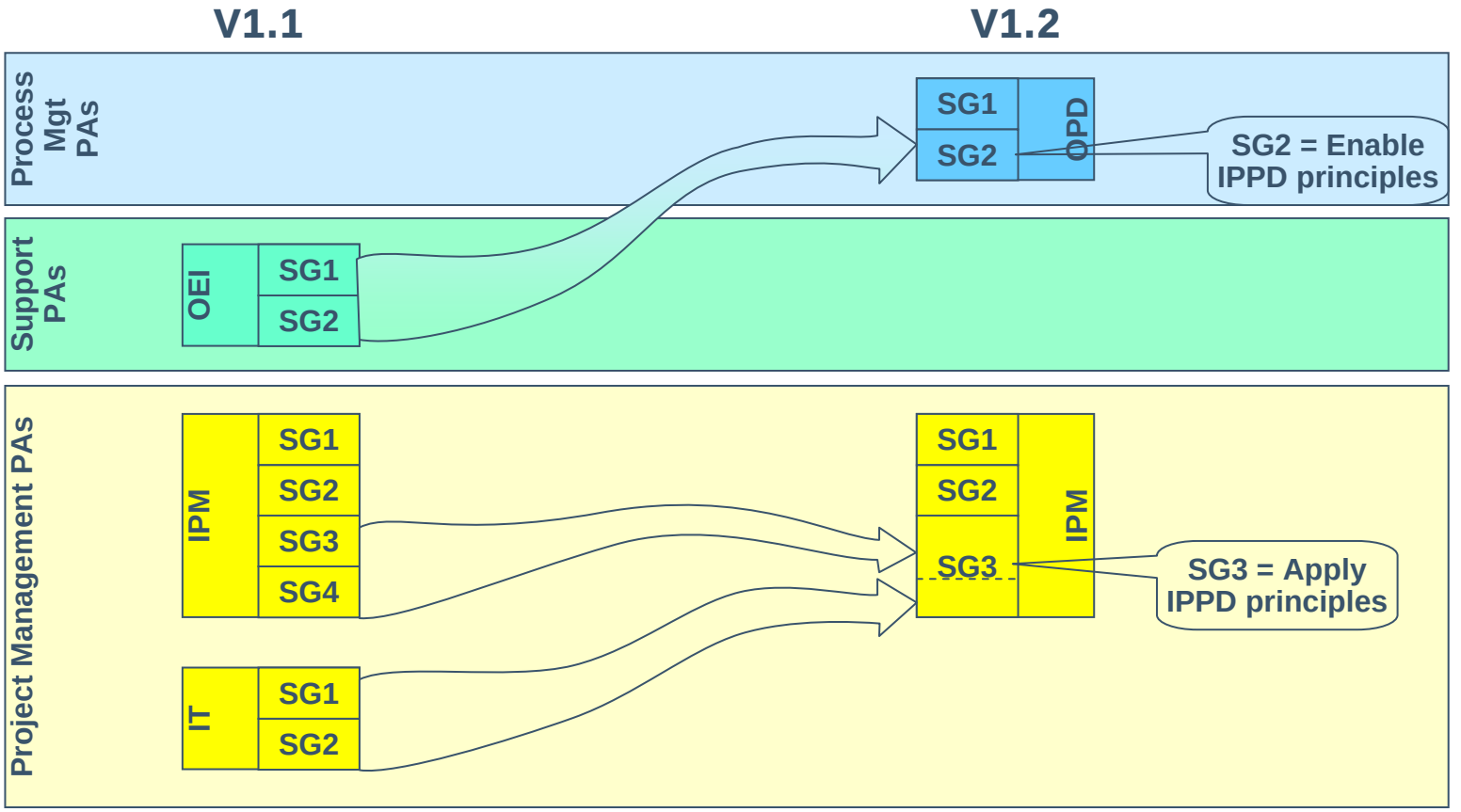
IPPD material is being revised significantly.

- Organization Environment for Integration PA removed and material moved to Organizational Process Definition (OPD) PA.
- Integrated Teaming PA removed and material moved to Integrated Project Management (IPM) PA.
- IPPD goals have been consolidated.
  - "Enable IPPD Management" in OPD
  - "Apply IPPD Principles" in IPM
- Overall material condensed and revised to be more consistent with other PAs.

CMMI Model Combinations



IPPD Changes



Supplier Agreement Management

Specific Goal	Specific Practice
Establish Supplier Agreements	**1.1 – Determine Acquisition Type** **1.2 – Select Suppliers** **1.3 – Establish Supplier Agreements**
Satisfy Supplier Agreements	**2.1 – Execute the Supplier Agreement** **2.2 – Monitor Selected Supplier Processes** **2.3 – Evaluate Selected Supplier Work Products** **2.4 – Accept the Acquired Product** **2.5 – Transition Products**

v1.1 SP2.1 “Review COTS Products,” was eliminated. “Identify candidate COTS products that satisfy requirements” is a new subpractice under the Technical Solutions Process Area SP1.1, “Develop Alternative Solutions and Selection Criteria.”

Organizational Process Focus

V1.1

SG1 – Determine Process Improvement Opportunities

1.1 – Establish Organizational Process Needs

1.2 – Appraise the Organization's Processes

1.3 – Identify the Organization's Process Improvements

SG2 – Plan and Implement Process Improvement Activities

2.1 – Establish Process Action Plans

2.2 – Implement Process Action Plans

2.3 – Deploy Organizational Process Assets

2.4 – Incorporate Process-Related Experiences into the Organizational Process Assets

V1.2

SG1 – Determine Process Improvement Opportunities

1.1 – Establish Organizational Process Needs

1.2 – Appraise the Organization's Processes

1.3 – Identify the Organization's Process Improvements

SG2 – Plan and Implement Process Improvement

2.1 – Establish Process Action Plans

2.2 – Implement Process Action Plans

New

SG3 – Deploy Organizational Process Assets and Incorporate Lessons Learned

3.1 – Deploy Organizational Process Assets

3.2 -- Deploy Standard Processes

3.3 -- Monitor Implementation

3.4 -- Incorporate Process Related Experiences into the Organizational Process Assets

SCAMPI A Changes for V1.2

Method implementation clarifications
- interviews in “virtual” organizations
- practice characterization rules
- organizational unit sampling options

Appraisal Disclosure Statement (ADS) improvements
- reduce redundancy with other appraisal documents
- improve usability for sponsor and government
- Level 4,5 mapping to business objectives
- require sponsor’s signature on the ADS
- require all team members to show agreement on findings
- Both V1,1 and V1.2 ADS reflect these today

Appraisal team will have responsibility for determination of “applicability” for SAM

Maturity level and capability level shelf life – 3 years, given 1 year of V1.2 availability

Published Appraisal Results

List of Published SCAMPI Appraisal Results

ORGANIZATION NAME:	Satyam Computer Services Ltd.
SPONSOR NAME:	Nagaraj Chevour
LEAD APPRAISER NAME:	Raghavan Nandyal
SEI PARTNER:	SITARA Technologies Pvt. Ltd.
APPRAISAL END DATE:	4/3/2004
MATURITY LEVEL ASSIGNED:	5
APPRAISED ORGANIZATIONAL UNIT:	
Entity Name:	SRU GE-GDC
Location(s):	Secunderabad, AP, India
CMMI MODEL USED:	CMMI-SW/IPPD, V1.1, Continuous
APPRAISAL METHOD USED:	SCAMPI v1.1

MODEL SCOPE & CAPABILITY RATINGS ASSIGNED:

Process Management		Project Management		Engineering		Support	
OPF	Capability Level 3	PP	Capability Level 4	REQM	Capability Level 3	CM	Capability Level 3
OPD	Capability Level 3	PMC	Capability Level 4	RD	Capability Level 4	PPQA	Capability Level 3
OT	Capability Level 3	SAM	Not Applicable	TS	Capability Level 5	MA	Capability Level 3
OPP	Capability Level 3	IPM	Capability Level 3	PI	Capability Level 3	DAR	Capability Level 3
OID	Capability Level 3	RSKM	Capability Level 4	VER	Capability Level 5	OEI	Capability Level 3
		IT	Capability Level 3	VAL	Capability Level 3	CAR	Capability Level 3
		ISM	Not Rated				
		QPM	Capability Level 3				

CMMI Training v1.2

Introduction to CMMI (Staged and Continuous)
- Editorial update released 9/05
- Updated v1.2 phased in this fall

Intermediate Concepts of CMMI
- Being updated for v1.2
- will better prepare students for SCAMPI training

CMMI Instructor Training
- Being updated to reflect v1.2 changes

"Delta" training from V1.1 to V1.2
- Will be available on-line for free
- More extensive upgrade course for fee
  - Appraisal Team members
  - Lead Appraisers, Instructors, candidates

CMMI V1.2 Schedules

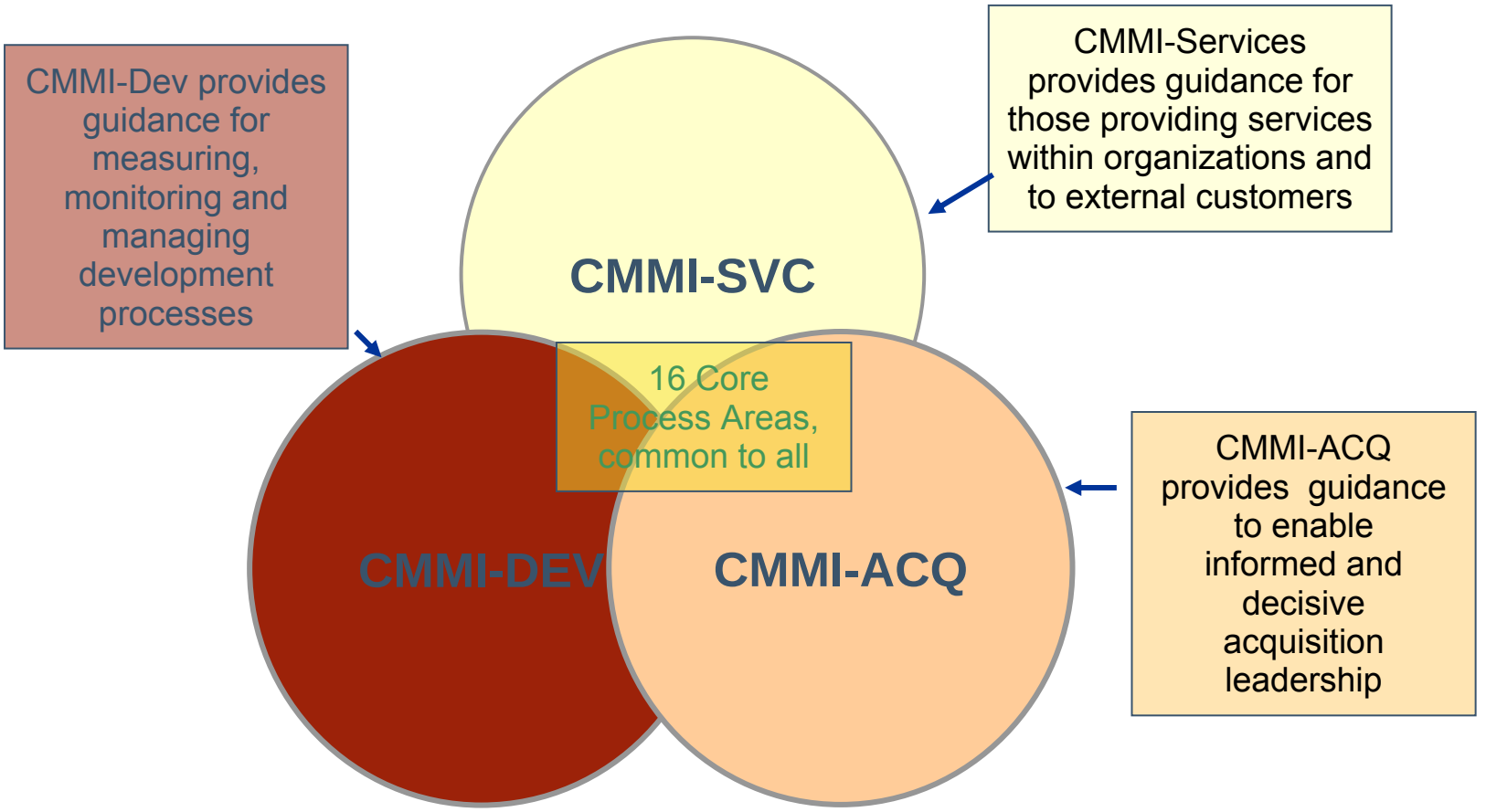
Version 1.2 CMMI Product Suite release	August 25, 2006
Update material available	August 25, 2006
Upgrade course available on-line	August 25, 2006
First Lead Appraiser “face to face”	October 16, 2006
V1.2 ADS required for all SCAMPIs	October, 2006
Last V1.1 Intro training	December, 2006
First expiration of V1.1 appraisals (3 year validity)	August 25, 2007
Last V1.1 appraisal	August 31, 2007

Beyond V1.2$_1$

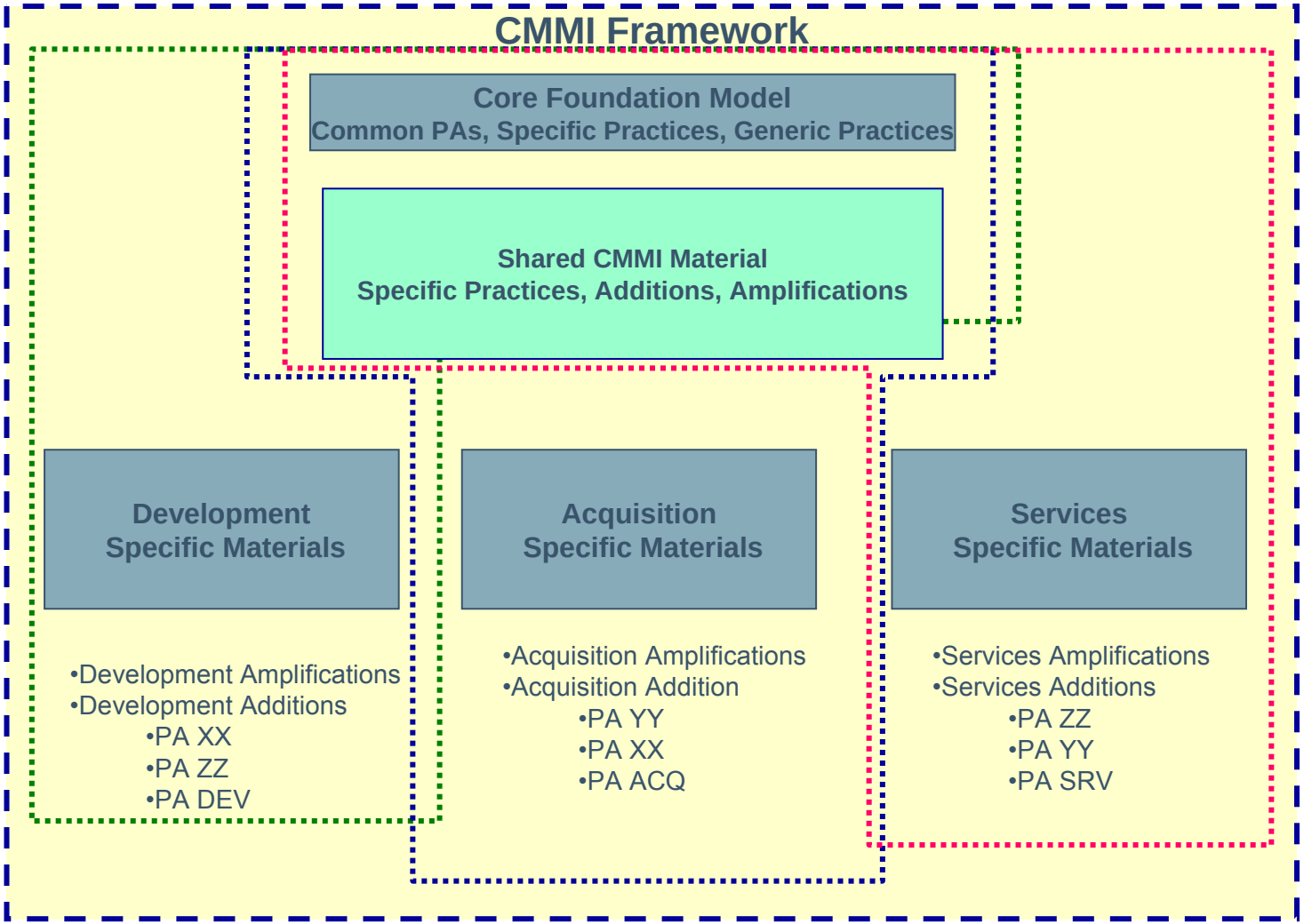
Improved architecture will allow post-V1.2 expansion.

- Extensions of the life cycle (Services, Outsourcing/Acquisition) could expand use of a common organizational framework:
  - allows coverage of more of the enterprise or potential partnering organizations
  - adapts model features to fit non-developmental efforts (e.g., CMMI Services, CMMI Acquisition)

3 Complementary "Constellations"



Architecture & Constellations



Beyond V1.2$_2$

First two new “constellations,” CMMI for Services and CMMI for Acquisition, have been “commissioned” by CMMI Steering Group. Development will be in parallel with V1.2 effort; publication sequenced after V1.2 rollout.

Northrop-Grumman is leading industry group for CMMI Services.

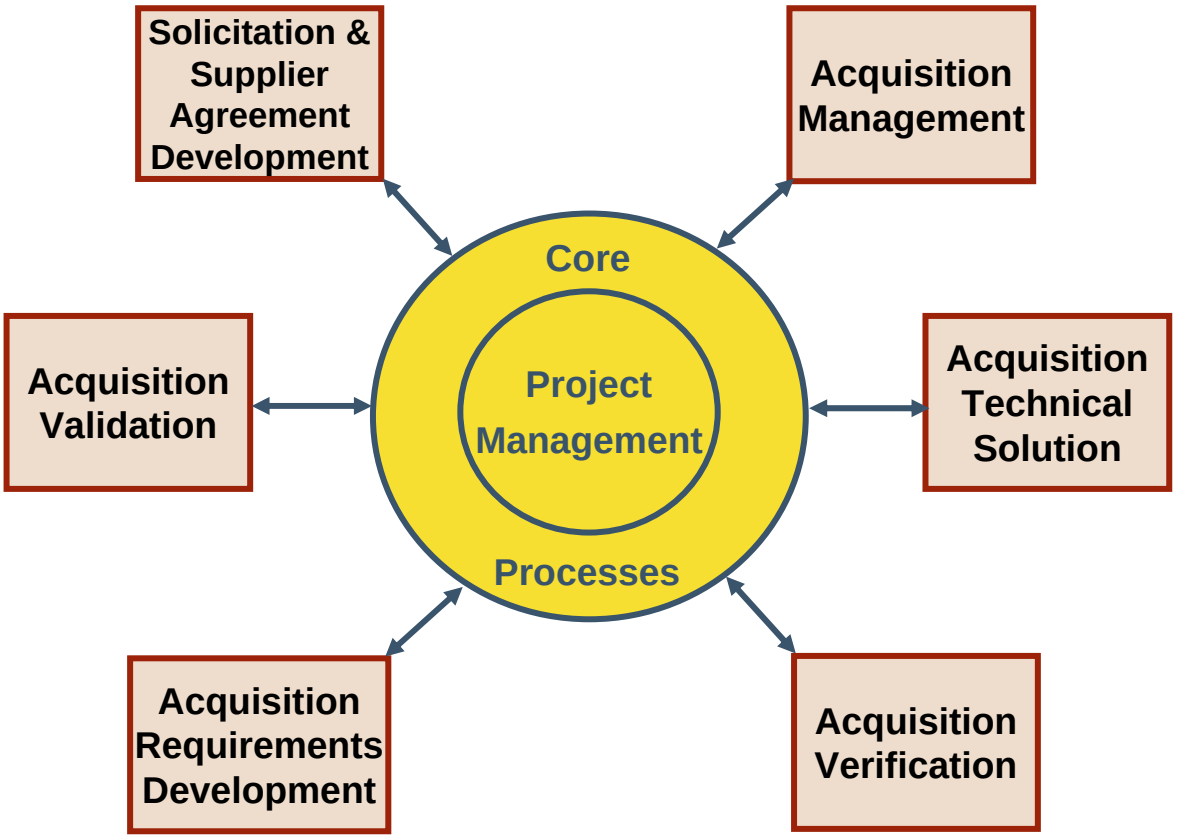
- Initial focus will be for organizations providing “DoD services” as well as internal IT:
  - System maintenance
  - Network Management, IT Services
  - IV&V

Beyond V1.2$_3$

SEI is coordinating development of CMMI-ACQ.

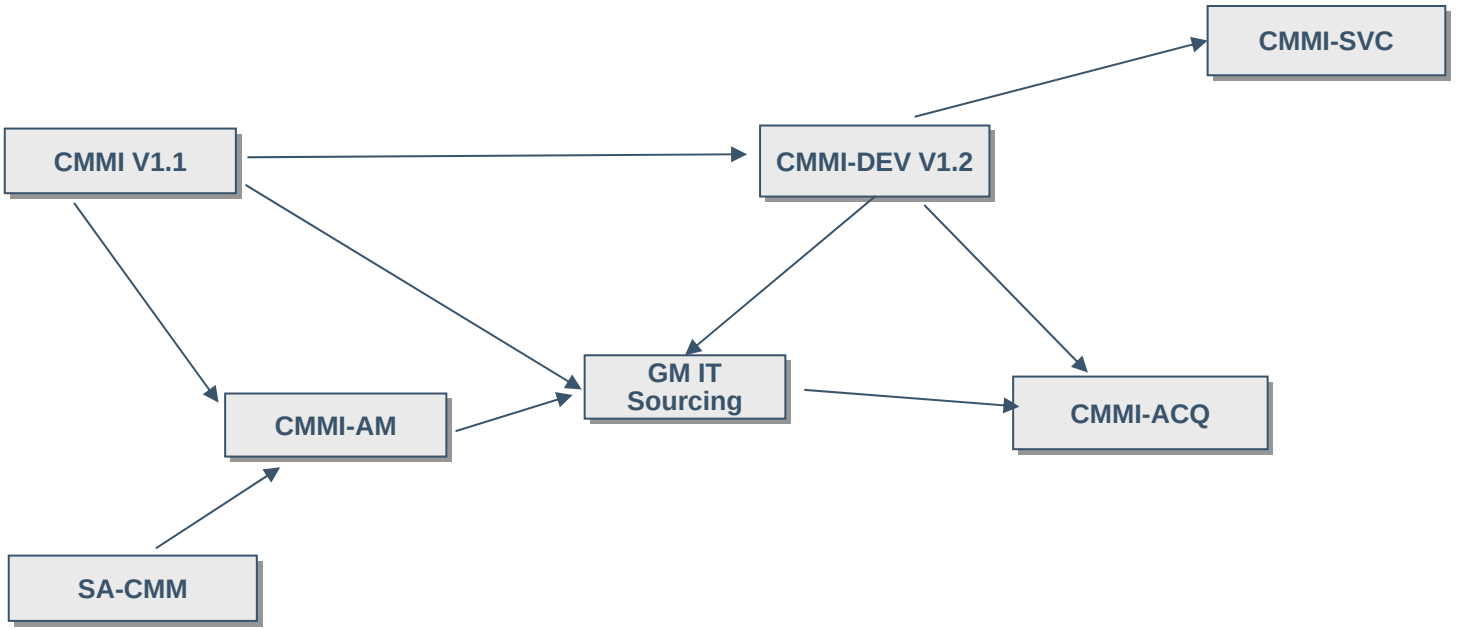
- Will build upon General Motors IT Sourcing expansion
- Will add government perspectives from both DoD and civil agencies

Initial CMMI-ACQ Key Acquisition Processes*



*based on initial CMMI-ACQ model developed by General Motors/SEI

Planned Sequence of Models



CMMI V1.2…and Beyond …the details

Topics

Overview of Model Changes

Detailed Changes

Glossary Changes

Process Area Changes

Model Changes

The model was changed mainly due to the following:

- Reduce complexity and size
- Expand model coverage

Reduce Complexity and Size

To reduce model complexity and size, the following changes were made:

- eliminated advanced practices and common features
- eliminated the Supplier Sourcing (SS) addition
- incorporated Integrated Supplier Management (ISM) into Supplier Agreement Management (SAM)
- consolidated and simplified the IPPD material
- added, modified, and consolidated definitions in the glossary (e.g., bidirectional traceability, subprocess)
- adopted a single book approach (i.e., both representations are published in one document)

Expand Model Coverage

To expand model coverage, the following changes were made:

- added hardware amplifications
- added two work environment specific practices —one in Organizational Process Definition (OPD) and one in Integrated Project Management (IPM)
- updated notes and examples to address service development and acquisition
- updated the model name to CMMI for Development (CMMI-DEV) to reflect the new CMMI architecture

Other Significant Model Changes

Other significant model changes made include

- improved the clarity of the Overview section (Part One)
- added information about and clarified how generic practices (GPs) are used
- moved the generic goals and practices to Part Two
- explained how process areas support the implementation of the GPs
- added GP elaborations for GP 3.2
- restricted the process areas that can be considered “not applicable” to SAM
- added emphasis on project startup in OPF and IPM

Topics

Overview of Model Changes

Detailed Changes

Glossary Changes

Process Area Changes

Advanced Practices Eliminated

There were two types of advanced practices in v1.1:

- those paired with a base practice
- those that stood alone

To eliminate advanced practices, the following strategies were used:

- Where a base and advance practice covered the same topic, the practices were combined.
- Where there was only an advanced practice, the advanced practice was retained as a specific practice.
- Specific practice numbering was simplified to exclude the capability level.

Base and Advanced Practices Combined

The following base and advanced practices were combined to form specific practices in v1.2.

Requirements Development

- SP 1.1: Elicit Needs (combined with “Collect Stakeholder Needs”)
- SP 3.5: Validate Requirements (combined with “Validate Requirements with Comprehensive Methods”)

Technical Solution

- SP 1.1: Develop Alternative Solutions and Selection Criteria (combined with “Develop Detailed Alternative Solutions and Selection Criteria”)
- SP 2.3: Design Interfaces Using Criteria (combined with “Establish Interface Descriptions”)

Advanced Practices Converted[1]

The following advanced practices were retained as specific practices in v1.2.

Requirements Management
- SP 1.2: Obtain Commitment to Requirements
- SP 1.4: Maintain Bidirectional Traceability of Requirements

Requirements Development
- SP 3.4: Analyze Requirements to Achieve Balance

Technical Solution
- SP 1.2: Select Product Component Solutions
- SP 2.2: Establish a Technical Data Package
- SP 2.4: Perform Make, Buy, or Reuse Analyses

Advanced Practices Converted[2]

Product Integration
- SP 1.2: Establish the Product Integration Environment
- SP 1.3: Establish Product Integration Procedures and Criteria

Verification
- SP 1.2: Establish the Verification Environment
- SP 1.3: Establish Verification Procedures and Criteria
- SP 2.3: Analyze Peer Review Data
- SP 3.2: Analyze Verification Results

Validation
- SP 1.2: Establish the Validation Environment
- SP 1.3: Establish Validation Procedures and Criteria

No More Common Features

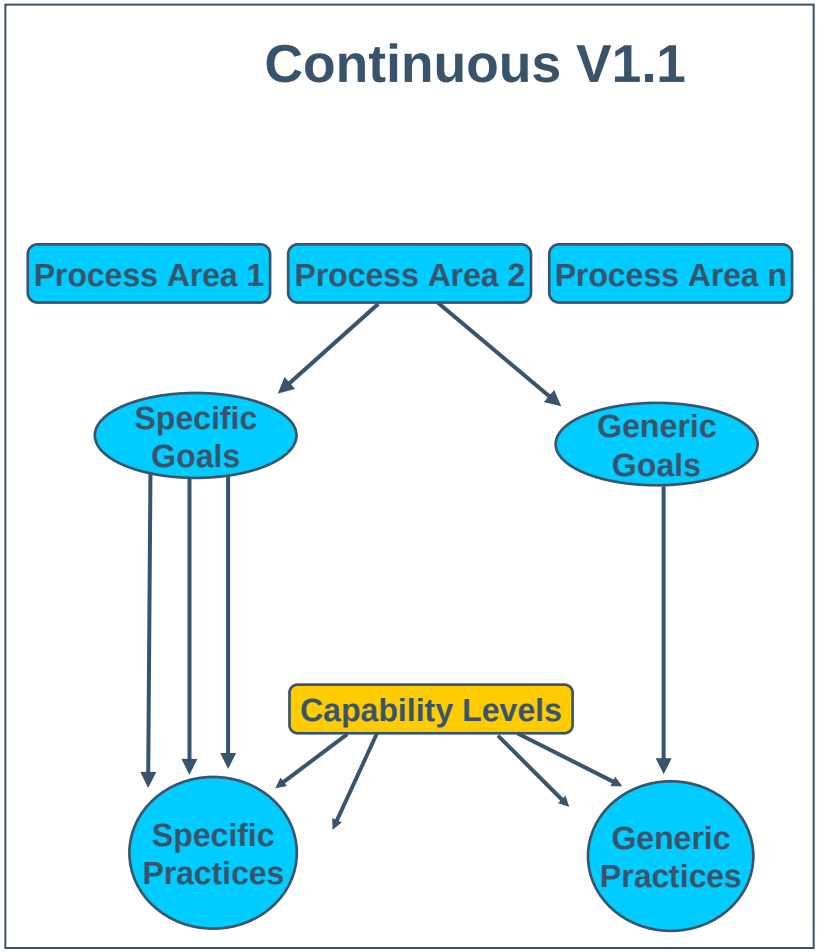
Discussion of common features was removed from Part 1.

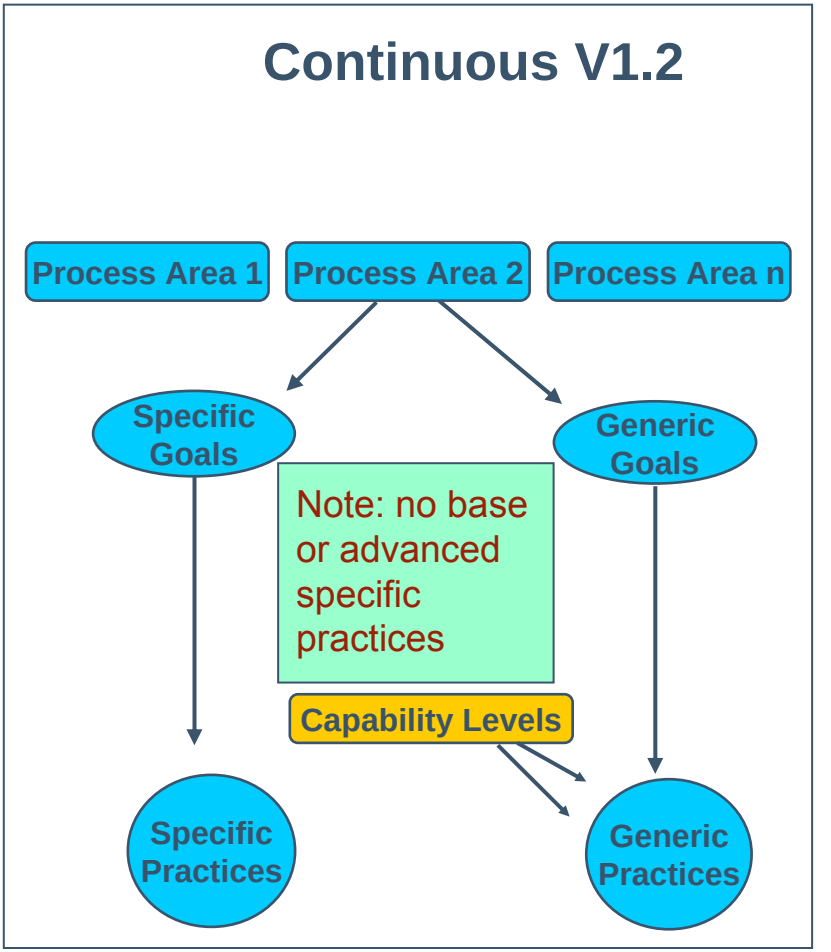
GPs are no longer organized by common features.

The common feature headings were removed.

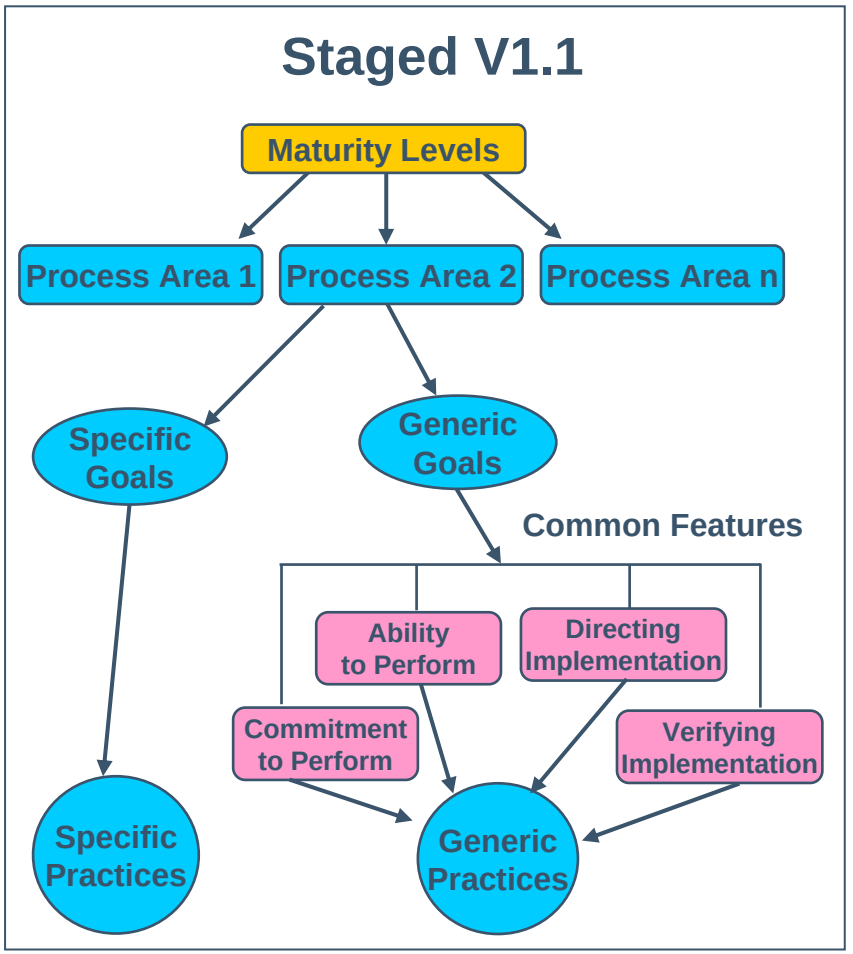
The generic practices in v1.2 are presented by generic goal and are sequentially numbered.

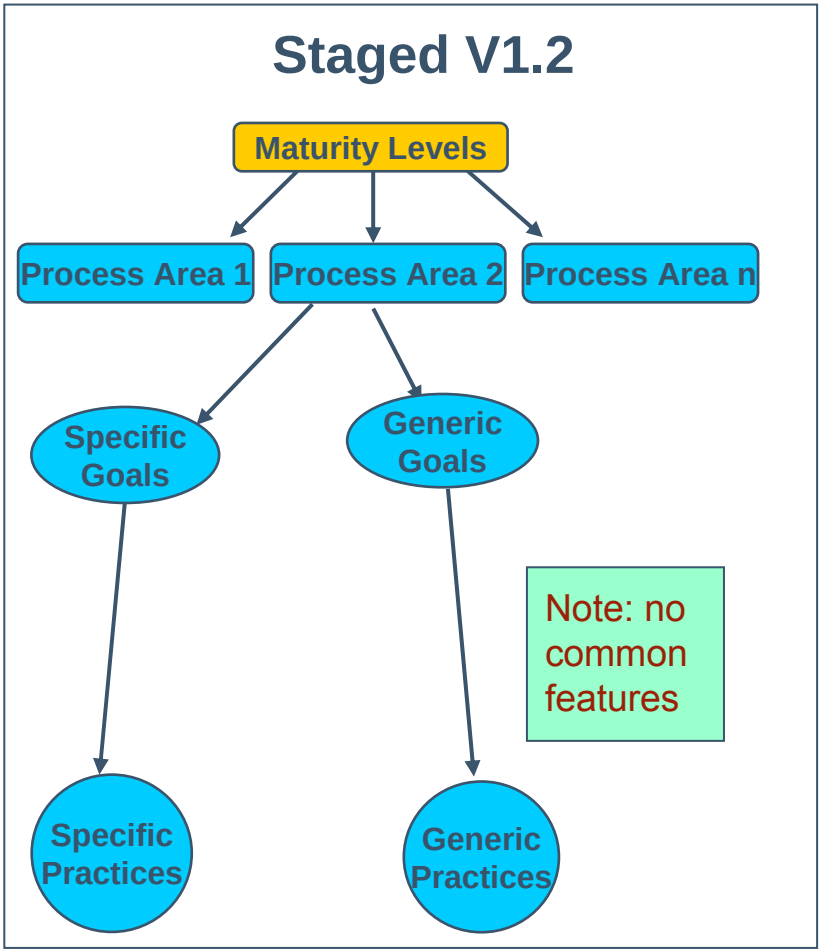
Model Structure[1]





Model Structure[2]





No More Supplier Sourcing Addition

Supplier Sourcing was eliminated as an addition.

ISM has been eliminated.

SAM has been enhanced to contain the unique material from ISM.

Two specific practices were added to Goal 2 in SAM:

- SP 2.2 - Monitor Selected Supplier Processes
- SP 2.3 - Evaluate Selected Supplier Work Products

Simplified IPPD Material

There are no longer whole process areas that address IPPD:

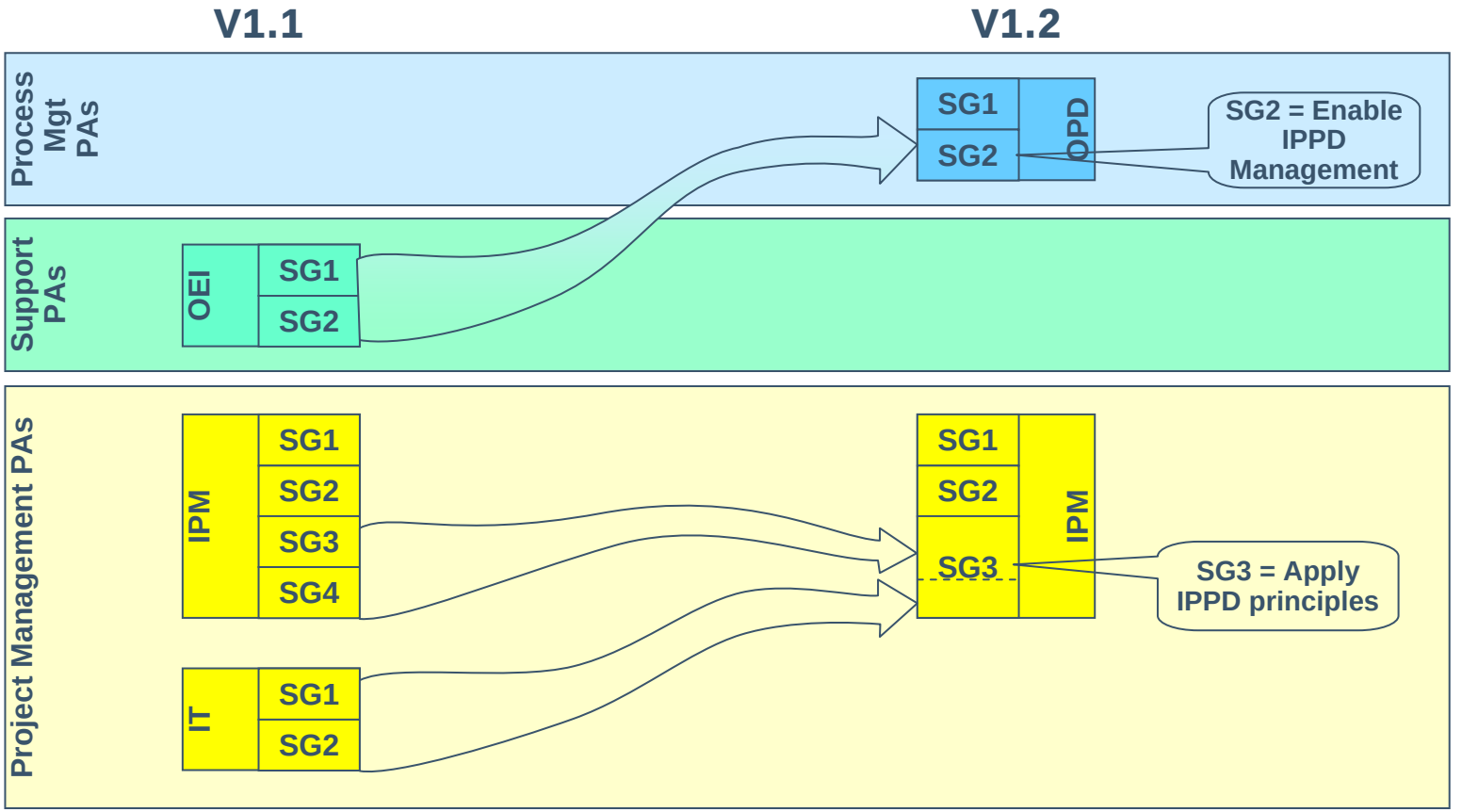
- removed OEI and moved material to OPD
- removed IT and moved material to IPM

Information that addressed “Enable IPPD Management” was moved to OPD.

Information that addressed “Apply IPPD Principles” was moved to IPM.

All IPPD material was condensed and revised to be more consistent with the other model material.

IPPD Changes Illustrated



The Model Is a Single Document

All representations, additions, and disciplines are in one document.

Users can choose to use:

- representation-specific content (i.e., continuous, staged)
- addition-specific content (i.e., IPPD)
- amplifications (i.e., hardware engineering, software engineering, systems engineering)

Added Hardware Amplifications and Examples

Six hardware amplifications were created to add emphasis on hardware engineering. Here is an example from TS.

SP 2.1 Design the Product or Product Component

Develop a design for the product or product component.

For Hardware Engineering
Detailed design is focused on product development of electronic, mechanical, electro-optical, and other hardware products and their components. Electrical schematics and interconnection diagrams are developed, mechanical and optical assembly models are generated, and fabrication and assembly processes are developed.

Hardware examples were also added to emphasize hardware engineering.

Added Work Environment Coverage

Work environment standards are established at the organizational level in OPD.

SP 1.6 Establish Work Environment Standards
Establish and maintain work environment standards.

The project's work environment is established at the project level in IPM.

SP 1.3 Establish the Project's Work Environment
Establish and maintain the project's work environment based on the organization's work environment standards.

Other Specific Practice Changes

OID, SP 1.4

Select process and technology improvements [not "improvement proposals"] for deployment across the organization.

OPP, SP 1.1

Select the processes or subprocesses [not "process elements"] in the organization's set of standard processes that are to be included in the organization's process-performance analysis.

Overview Section Improvements

The following improvements were made to the model overview (i.e., Part One):

- The chapter containing the generic goals and practices was moved to Part Two with the process areas.
- All definitions are consolidated into the glossary.
- Chapters were reordered into a more logical sequence.
- The Preface and Using CMMI Models chapter were rewritten and updated.
- Descriptions were updated to reflect the new CMMI architecture:
  - Added descriptions of constellations and additions
  - Removed descriptions of base and advanced practices and common features

Improved Generic Practices[1]

Editorial changes were made to the generic practices. These slides highlight the changes that affect the content.

GP 1.1: Perform Specific Practices
The practice title and statement changed from “perform base practices” to “perform specific practices.”

GP 2.2: Plan the Process
The informative material was condensed to be consistent with the other generic practices.

GP 2.4: Assign Responsibility
In the informative material “and authority” was added.

Improved Generic Practices²

GP 2.6: Manage Configurations
In the GP statement, “levels of configuration management” was changed to “levels of control.”

GP 2.9 Objectively Evaluate Adherence
Added informative material to emphasize work products also.

GP 5.2: Correct Root Causes of Problems
Added notes that the focus of this GP is on a quantitatively managed process, though root causes may be found outside of that process.

Explained Generic Practices Better

Moved generic goals and practices to Part Two with the process areas so that all normative elements of the model are consolidated in one place

Added information about how process areas support the implementation of generic practices (GPs)

Added GP elaborations for GP 3.2

"Not Applicable" Process Areas

The set of PAs evaluated to achieve a maturity level is an important variable when conducting an appraisal. In v1.1 it was not clear which PAs could be considered "not applicable."

In v1.2, the guidance for appraisals exists in both SCAMPI[SM] MDD Appendix A and SCAMPI A Appraisal Disclosure Statement (ADS):

- Only SAM can be declared not applicable.
- Decisions on PAs included in the appraisal must be made by the lead appraiser in conjunction with the appraisal sponsor.
- Rationale for declaring SAM to be "not applicable" must be provided in the Appraisal Disclosure Statement.

Topics

Overview of Model Changes

Detailed Changes

Glossary Changes

Process Area Changes

Glossary Changes

The following slides contain significant changes to glossary definitions. Definitions that only had editorial changes are not included.

New definitions: addition, amplification, bidirectional traceability, customer requirement, data, functional configuration audit, hardware engineering, higher level management, physical configuration audit, project startup, and service.

Revised definitions: acquisition, appraisal, appraisal findings, appraisal scope, audit, capability evaluation, configuration audit, customer, data management, establish and maintain, generic goal, objective evidence, process element, product, product component, project, quality- and process-performance objectives, requirements traceability, shared vision, subprocess, traceability, and work product.

Definitions Deleted From the Glossary

Deleted definitions: ability to perform, advanced practices, agreement/contract requirements, appraisal tailoring, appraisal team leader, base practices, CMMI model tailoring, commitment to perform, directing implementation, discipline amplification, lead appraiser, process context, solicitation package, strength, verifying implementation, weakness

Many of these definitions were deleted because the term wasn't used in the model or the overall concept was removed.

New Definitions[1]

addition
In the CMMI Product Suite, a clearly marked model component that contains information of interest to particular users. In a CMMI model, all additions bearing the same name (e.g., the IPPD addition) may be optionally selected as a group for use.

amplification
Amplifications are informative model components that contain information relevant to a particular discipline. For example, to find an amplification for software engineering, you would look in the model for items labeled “For Software Engineering.” The same is true for other disciplines.

New Definitions[2]

bidirectional traceability
An association among two or more logical entities that is discernable in either direction (i.e., to and from an entity). (See also "requirements traceability" and "traceability.")

customer requirement
The result of eliciting, consolidating, and resolving conflicts among the needs, expectations, constraints, and interfaces of the product's relevant stakeholders in a way that is acceptable to the customer. (See also “customer.”)

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New Definitions[3]

data
Recorded information, regardless of the form or method of recording, including technical data, computer software documents, financial information, management information, representation of facts, numbers, or datum of any nature that can be communicated, stored, and processed.

functional configuration audit
An audit conducted to verify that the development of a configuration item has been completed satisfactorily, that the item has achieved the performance and functional characteristics specified in the functional or allocated configuration identification, and that its operational and support documents are complete and satisfactory. (See also "configuration audit," "configuration management," and "physical configuration audit.")

New Definitions[4]

hardware engineering

The application of a systematic, disciplined, and quantifiable approach to transform a set of requirements representing the collection of stakeholder needs, expectations, and constraints using documented techniques and technology to design, implement, and maintain a tangible product. (See also "software engineering" and "systems engineering.")

In CMMI, hardware engineering represents all technical fields (e.g., electrical or mechanical) that transform requirements and ideas into tangible and producible products .

New Definitions[5]

higher level management
The person or persons who provide the policy and overall guidance for the process, but do not provide the direct day-to-day monitoring and controlling of the process. Such persons belong to a level of management in the organization above the immediate level responsible for the process and can be (but are not necessarily) senior managers. (See also "senior manager.")

physical configuration audit
An audit conducted to verify that a configuration item, as built, conforms to the technical documentation that defines and describes it. (See also, "configuration audit," "configuration management," and "functional configuration audit.")

New Definitions[6]

project startup
When a set of interrelated resources are directed to develop or deliver one or more products for a customer or end user. (See also “project.”)

service
In the CMMI Product Suite, a service is a product that is intangible and non-storable. (See also "product," "customer," and "work product.")

Revised Definitions[1]

acquisition
The process of obtaining products (goods and services) through contract.

appraisal
In the CMMI Product Suite, an examination of one or more processes by a trained team of professionals using an appraisal reference model as the basis for determining, at a minimum, strengths and weaknesses. (See also “assessment” and “capability evaluation.”)

appraisal findings
The results of an appraisal that identify the most important issues, problems, or opportunities for process improvement within the appraisal scope. Appraisal findings are inferences drawn from corroborated objective evidence.

Revised Definitions[2]

appraisal scope
The definition of the boundaries of the appraisal encompassing the organizational limits and the CMMI model limits within which the processes to be investigated operate.

audit
In CMMI process improvement work, an objective examination of a work product or set of work products against specific criteria (e.g., requirements).

Revised Definitions[3]

capability evaluation
An appraisal by a trained team of professionals used as a discriminator to select suppliers, to monitor suppliers against the contract, or to determine and enforce incentives. Evaluations are used to gain insight into the process capability of a supplier organization and are intended to help decision makers make better acquisition decisions, improve subcontractor performance, and provide insight to a purchasing organization. (See also “appraisal” and “assessment.”)

configuration audit
An audit conducted to verify that a configuration item, or a collection of configuration items that make up a baseline, conforms to a specified standard or requirement. (See also “audit,” “configuration item,” "functional configuration audit," and "physical configuration audit.")

Revised Definitions[4]

customer
The party (individual, project, or organization) responsible for accepting the product or for authorizing payment. The customer is external to the project (except possibly when integrated teams are used, as in IPPD), but not necessarily external to the organization. The customer may be a higher level project. Customers are a subset of stakeholders. (See also “stakeholder.”)

In most cases where this term is used, the preceding definition is intended; however, in some contexts, the term "customer" is intended to include other relevant stakeholders. (See also “customer requirement.”)

Revised Definitions[5]

data management

The disciplined processes and systems that plan for, acquire, and provide stewardship for business and technical data, consistent with data requirements, throughout the data lifecycle.

establish and maintain

In the CMMI Product Suite, you will encounter goals and practices that include the phrase “establish and maintain.” This phrase means more than a combination of its component terms; it includes documentation and usage. For example, “Establish and maintain an organizational policy for planning and performing the organizational process focus process” means that not only must a policy be formulated, but it also must be documented, and it must be used throughout the organization.

Revised Definitions[6]

generic goal
A required model component that describes the characteristics that must be present to institutionalize the processes that implement a process area. (See also “institutionalization.”)

objective evidence
As used in CMMI appraisal materials, documents or interview results used as indicators of the implementation or institutionalization of model practices. Sources of objective evidence can include instruments, presentations, documents, and interviews.

Revised Definitions[7]

process element
The fundamental unit of a process. A process can be defined in terms of subprocesses or process elements. A subprocess can be further decomposed into subprocesses or process elements; a process element cannot. (See also "process" and "subprocess.")

Each process element covers a closely related set of activities (e.g., estimating element and peer review element). Process elements can be portrayed using templates to be completed, abstractions to be refined, or descriptions to be modified or used. A process element can be an activity or task.

Revised Definitions[8]

product
In the CMMI Product Suite, a work product that is intended for delivery to a customer or end user. The form of a product can vary in different contexts. (See also “customer,” "product component," "service," and “work product.”)

product component
In the CMMI Product Suite, a work product that is a lower level component of the product. Product components are integrated to produce the product. There may be multiple levels of product components. (See also “product” and “work product.”)

Revised Definitions[9]

project

In the CMMI Product Suite, a managed set of interrelated resources which delivers one or more products to a customer or end user. A project has a definite beginning (i.e., project startup) and typically operates according to a plan. Such a plan is frequently documented and specifies what is to be delivered or implemented, the resources and funds to be used, the work to be done, and a schedule for doing the work. A project can be composed of projects. (See also “project startup.”)

Revised Definitions[10]

quality and process-performance objectives
Objectives and requirements for product quality, service quality, and process performance. Process-performance objectives include quality; however, to emphasize the importance of quality in the CMMI Product Suite, the phrase quality and process-performance objectives is used rather than just process-performance objectives.

requirements traceability
A discernable association between requirements and related requirements, implementations, and verifications. (See also "bidirectional traceability" and "traceability.")

Revised Definitions[11]

shared vision
A common understanding of guiding principles including mission, objectives, expected behavior, values, and final outcomes, which are developed and used by a project.

subprocess
A process that is part of a larger process. A subprocess can be decomposed into subprocesses and/or process elements. (See also “process," "process description,” and "process element.")

traceability
A discernable association among two or more logical entities such as requirements, system elements, verifications, or tasks. (See also "bidirectional traceability" and “requirements traceability.”)

Revised Definitions[12]

work product
In the CMMI Product Suite, a useful result of a process. This can include files, documents, products, parts of a product, services, process descriptions, specifications, and invoices. A key distinction between a work product and a product component is that a work product is not necessarily part of the product. (See also “product” and “product component.”)

In CMMI models, you will see the phrase work products and services. Even though the definition of work product includes services, this phrase is used to emphasize the inclusion of services in the discussion.

Topics

Overview of Model Changes

Detailed Changes

Glossary Changes

Process Area Changes

Process Area Improvements[1]

Improvements were made to all process areas; some process areas changed more than others. Only the process areas that were changed significantly will be addressed.

Many of these changes were discussed earlier. However, these slides show you significant changes by process area.

Process Area Improvements[2]

The following process areas were improved significantly:

- Integrated Project Management +IPPD (IPM+IPPD)
- Organizational Process Definition +IPPD (OPD+IPPD)
- Organizational Process Focus (OPF)
- Requirements Management (REQM)
- Requirements Development (RD)
- Supplier Agreement Management (SAM)
- Technical Solution (TS)
- Validation (VAL)
- Verification (VER)

Integrated Project Management +IPPD[1]

Specific Goal	Specific Practice
Use the Project's Defined Process	1.1 – Establish the Project's Defined Process
	1.2 – Use Organizational Process Assets for Planning Project Activities
	1.3 – Establish the Project's Work Environment
	1.4 – Integrate Plans
	1.5 – Manage the Project Using the Integrated Plans
	1.6 – Contribute to the Organizational Process Assets

- Modified SP 1.1 from "Establish and maintain the project's defined process" to "Establish and maintain the project's defined process from project startup through the life of the project."
- Added SP 1.3 "Establish the Project's Work Environment." (This practice is new to CMMI.)

Integrated Project Management +IPPD[2]

Specific Goal	Specific Practice
Coordinate and Collaborate with Relevant Stakeholders	2.1 – Manage Stakeholder Involvement 2.2 – Manage Dependencies 2.3 – Resolve Coordination Issues
Apply IPPD Principles	3.1 – Establish the Project's Shared Vision 3.2 – Establish the Integrated Team Structure 3.3 – Allocate Requirements to Integrated Teams 3.4 – Establish Integrated Teams 3.5 – Ensure Collaboration among Interfacing Teams

- Reduced the IPPD Addition to one goal (SG3 "Apply IPPD Principles") and its practices.
- To emphasize the IPPD Addition, the name of this process area is now "Integrated Project Management +IPPD" or "IPM +IPPD."

Organizational Process Definition +IPPD[1]

Specific Goal	Specific Practice
Establish Organizational Process Assets	1.1 – Establish Standard Processes 1.2 – Establish Lifecycle Model Descriptions 1.3 – Establish Tailoring Criteria and Guidelines 1.4 – Establish the Organization's Measurement Repository 1.5 – Establish the Organization's Process Asset Library **1.6 – Establish Work Environment Standards**

- Added "and work environment standards" to the purpose statement.
- Added SP 1.6 "Establish Work Environment Standards." (This practice is new to CMMI.)

Organizational Process Definition +IPPD[2]

Specific Goal	Specific Practice
Enable IPPD Management	2.1 – Establish Empowerment Mechanisms
	2.2 – Establish Rules and Guidelines for Integrated Teams
	2.3 – Balance Team and Home Organization Responsibilities

- Added an IPPD Addition to OPD (SG2 “Enable IPPD Management” and its practices).
- To emphasize the IPPD Addition, the name the process area is now “Organizational Process Definition +IPPD” or “OPD +IPPD.”

Organizational Process Focus[1]

Specific Goal	Specific Practice
Determine Process Improvement Opportunities	1.1 – Establish Organizational Process Needs
	1.2 – Appraise the Organization's Processes
	1.3 – Identify the Organization's Process Improvements

- Modified the purpose statement to emphasize deployment.
- SP 1.2 "Appraise the organization's processes periodically and as needed to maintain an understanding of their strengths and weaknesses." uses "organization's processes" instead of "processes of the organization."

Organizational Process Focus[2]

Specific Goal	Specific Practice
Plan and Implement Process Improvements	**2.1 – Establish Process Action Plans** **2.2 – Implement Process Action Plans**

- Modified SG2 from “Plan and Implement Process Improvement Activities” to “Plan and Implement Process Improvements.”
- Moved to a new SG3 and modified what were SP 2.3 and SP 2.4 in v1.1.

Organizational Process Focus[3]

Specific Goal	Specific Practice
Deploy Organizational Process Assets and Incorporate Lessons Learned	**3.1 – Deploy Organizational Process Assets** **3.2 – Deploy Standard Processes** **3.3 – Monitor Implementation** **3.4 – Incorporate Process-Related Experiences into the Organizational Process Assets**

- Added new SG3, "Deploy Organizational Process Assets and Incorporate Lessons Learned."
- Moved what were SP 2.3 and SP 2.4 in v1.1 to the new SG3 as SP 3.1 and SP 3.4.
- Added two new SPs: SP 3.2 "Deploy Standard Processes," and SP 3.3 "Monitor Implementation."

Requirements Management

Specific Goal	Specific Practice
Manage Requirements	1.1 – Obtain an Understanding of Requirements
	1.2 – Obtain Commitment to Requirements
	1.3 – Manage Requirements Changes
	1.4 – Maintain Bidirectional Traceability of Requirements
	1.5 – Identify Inconsistencies Between Project Work and Requirements

- V1.2 REQM SP 1.4 practice statement now reads, “Maintain bidirectional traceability among the requirements and work products.”
- Project plans are no longer mentioned in this SP statement.
- The description of bidirectional traceability is improved as is its definition in the glossary.

Requirements Development[1]

Specific Goal	Specific Practice
Develop Customer Requirements	1.1 – Elicit Needs 1.2 – Develop the Customer Requirements
Develop Product Requirements	2.1 – Establish Product and Product Component Requirements 2.2 – Allocate Product Component Requirements 2.3 – Identify Interface Requirements

- Former base practice “Collect Stakeholder Needs” is eliminated and former advanced practice, “Elicit Needs” is kept.
- Informative text is added to the introductory notes about applying RD to maintenance projects.

Requirements Development[2]

Specific Goal	Specific Practice
Analyze and Validate Requirements	3.1 – Establish Operational Concepts and Scenarios
	3.2 – Establish a Definition of Required Functionality
	3.3 – Analyze Requirements
	3.4 – Analyze Requirements to Achieve Balance
	3.5 – Validate Requirements

- Material from V1.1 TS SP 1.2, “Evolve Operational Concepts and Scenarios,” is incorporated into RD SP 3.1.
- Material from V1.1 RD SP 3.5-1, “Validate Requirements,” and RD SP 3.5-2, “Validate Requirements with Comprehensive Methods” were consolidated into a single practice.

Supplier Agreement Management

Specific Goal	Specific Practice
Establish Supplier Agreements	1.1 – Determine Acquisition Type 1.2 – Select Suppliers 1.3 – Establish Supplier Agreements
Satisfy Supplier Agreements	2.1 – Execute the Supplier Agreement 2.2 – Monitor Selected Supplier Processes 2.3 – Evaluate Selected Supplier Work Products 2.4 – Accept the Acquired Product 2.5 – Transition Products

- V1.1 SAM SP2.1 “Review COTS Products,” was eliminated. “Identify candidate COTS products that satisfy requirements” is a new subpractice under the Technical Solutions Process Area SP1.1, “Develop Alternative Solutions and Selection Criteria.”
- SP2.2 and SP2.3 were added because ISM was eliminated.
- The purpose of SAM was also updated.

Technical Solution[1]

Specific Goal	Specific Practice
Select Product-Component Solutions	1.1 – Develop Alternative Solutions and Selection Criteria
	1.2 – Select Product-Component Solutions

- V1.1 TS SP 1.1-1, “Develop Alternative Solutions and Selection Criteria,” and TS SP 1.1-2, “Develop Detailed Alternative Solutions and Selection Criteria” are consolidated into a single practice.
- “Identify candidate COTS products that satisfy requirements” is a new subpractice under SP1.1.
- V1.1 TS SP 1.2 “Evolve Operational Concepts and Scenarios” is incorporated into RD SP 3.1, “Establish Operational Concepts and Scenarios.”

Technical Solution²

Specific Goal	Specific Practice
Develop the Design	2.1 – Design the Product or Product Component
	2.2 – Establish a Technical Data Package
	2.3 – Design Interfaces Using Criteria
	2.4 – Perform Make, Buy, or Reuse Analyses
Implement the Product Design	3.1 – Implement the Design
	3.2 – Develop Product Support Documentation

- V1.1 TS SP 2.3-1, “Establish Interface Descriptions,” and TS SP 2.3-3, “Design Interfaces Using Criteria” are consolidated into a single practice.

Validation

Specific Goal	Specific Practice
Prepare for Validation	1.1 – Select Products for Validation
	1.2 – Establish the Validation Environment
	1.3 – Establish Validation Procedures and Criteria
Validate Product or Product Components	2.1 – Perform Validation
	2.2 – Analyze Validation Results

- Notes were added to VAL to stress that validation activities are performed incrementally and involve relevant stakeholders.
- The phrase “and identify issues” was deleted from the statement of SP 2.2 “Analyze Validation Results” to maintain parallelism with VER SP 3.2 “Analyze Verification Results.”

Verification[1]

Specific Goal	Specific Practice
Prepare for Verification	1.1 – Select Work Products for Verification 1.2 – Establish the Verification Environment 1.3 – Establish Verification Procedures and Criteria
Perform Peer Reviews	2.1 – Prepare for Peer Reviews 2.2 – Conduct Peer Reviews 2.3 – Analyze Peer Review Data

- No changes to SG1, SG2, or their practices.

Verification²

Specific Goal	Specific Practice
Verify Selected Work Products	3.1 – Perform Verification
	3.2 – Analyze Verification Results

- The phrase “and identify corrective action” was deleted from both the title and statement of SP 3.2 “Analyze Verification Results. (Corrective action is handled in PMC SG2, “Manage Corrective Action to Closure.)

Summary

Many changes were made to the CMMI models to improve quality. The major changes include

- name changed to “CMMI for Development”
- both representations in one document
- amplifications improved; added hardware amplifications
- common features and advanced practices eliminated
- SS addition eliminated; ISM brought into SAM
- guidelines for “not applicable” process areas clarified
- overview and glossary improved
- work environment material added to OPD and IPM
- IPPD material simplified and consolidated
- process deployment strengthened in IPM and OPF

Applying CMMI in Small Settings

Where are we with our work in small settings?

- completed technical feasibility pilots in Huntsville, Alabama with two small companies in the US Army supply chain
- posted the toolkit from this pilot for review:
  - http://www.sei.cmu.edu/ttp/publications/toolkit
- chartered a project to further research in and evolve guidance for CMMI in Small Settings (CSS)

Where are we going?

- International Research Workshop for Process Improvement in Small Settings held October 19-20, 2005
- call for Interest in CSS project is posted on SEI web:
  - http://www.sei.cmu.edu/cmmi/acss/participation.html

Purpose

The purpose of this module is to describe the major changes to the SCAMPI A appraisal method for v1.2.

Revision Process

The CMMI Steering Group provided a long-term strategy and the upgrade criteria for v1.2.

The SCAMPI Upgrade Team (SUT) reviewed change requests to identify possible changes for the v1.2 appraisal method documents: Appraisal Requirements for CMMI (ARC) and Method Definition Document (MDD).

The CMMI Steering Group served as the configuration control board for v1.2 changes to the ARC and MDD.

The SUT developed a draft of the ARC and MDD for review by lead appraisers in May 2006.

The ARC and MDD were released as part of the v1.2 CMMI Product Suite.

SCAMPI A V1.2 Major Themes

Reduce complexity and ambiguity

Provide additional guidance where needed

Strengthen appraisal planning and conduct

Strengthen appraisal reporting

Define appraisal validity period

Strengthen lead appraiser requirements

Reduce Complexity[1]

The requirement for instruments (e.g., questionnaires) was removed.

Only two types of objective evidence are now required:

- documents
- interviews

The following sections in MDD were revised:

- switched 2.2 Verify and Validate Objective Evidence and 2.3 Document Objective Evidence so that the order of tasks reflects the natural order of conducting an appraisal
- separated Verify Objective Evidence and Validate Preliminary Findings to better describe each process

Reduce Complexity^2

The use of the term instantiation was changed:

- Instantiation is now defined as “the implementation of a model practice used in the appropriate context within the boundaries of an organizational unit.”
- The word “instantiation” for project and organizational-wide entities was replaced with “project” or “support group.”

Reduce Ambiguity

The rating Not Rated was clarified:

- Process areas outside of the model scope are rated as Out of Scope. For example, for a maturity level 3 appraisal, maturity level 4 and 5 process areas are rated as Out of Scope.
- For process areas that have insufficient data to be rated, the rating is Not Rated.
- Process areas in the model scope, but outside the organizational scope are rated as Not Applicable. The only process area that can be Not Applicable is SAM (as determined by the appraisal team).

The practice characterization tables were revised:

- clarified the use of virtual versus live interviews
- changed “face-to-face interviews” to “oral interviews”

Provide Additional Guidance

Guidance for readiness reviews was revised to include team and logistical readiness.

Additional guidance was provided for using virtual methods (e.g., for interviews and briefings).

Additional guidance was provided for using alternative practices (i.e., Appendix C: Alternative Practice Identification and Characterization Guidance).

Strengthen Appraisal Planning and Conduct

Organizational unit sampling was revised to*

- strengthen parameters and limits for organizational sampling (e.g., identifying a minimum number of focus projects)
- include additional criteria for reporting sampling decisions

The Conduct Appraisal Phase must now be complete within 90 days.

Appraisal team members are now required to sign final findings.

*Changes to address sampling were extensive. Refer to the MDD for details.

Strengthen Appraisal Reporting

The Appraisal Disclosure Statement (ADS) now requires the following information.

Organizational sampling criteria and decisions (e.g., projects included, projects excluded, percentage of organization represented)

Basis for maturity/capability level 4 and 5 appraisal results
- subprocesses statistically managed
- mapping of these subprocesses to quality and process-performance objectives

Signatures of both the lead appraiser and sponsor
- The lead appraiser affirms that the appraisal scope is representative of the organizational unit.
- The sponsor affirms the accuracy of the ADS and authorizes the SEI to conduct any audits deemed necessary.

Define Appraisal Validity Period

V1.2 appraisal results are valid for a maximum of 3 years from the date of the ADS.

V1.1 appraisals will expire on August 31, 2007 or 3 years after the date the appraisal was conducted, whichever is later.

Strengthen Lead Appraiser Requirements

Prior to conducting a v1.2 SCAMPI appraisal, the following must occur:

- Current candidate and authorized lead appraisers and team leaders must complete CMMI v1.2 Upgrade Training.
- Candidate and authorized lead appraisers must attend SCAMPI Face-to-Face Training.
- Those who want to conduct v1.2 SCAMPI level 4 or 5 appraisals must be certified. Certification requirements address the following:
  - education, training, and experience in level 4 and 5 concepts
  - completion of an oral exam

Summary

The SCAMPI A appraisal method was revised based on change requests received to

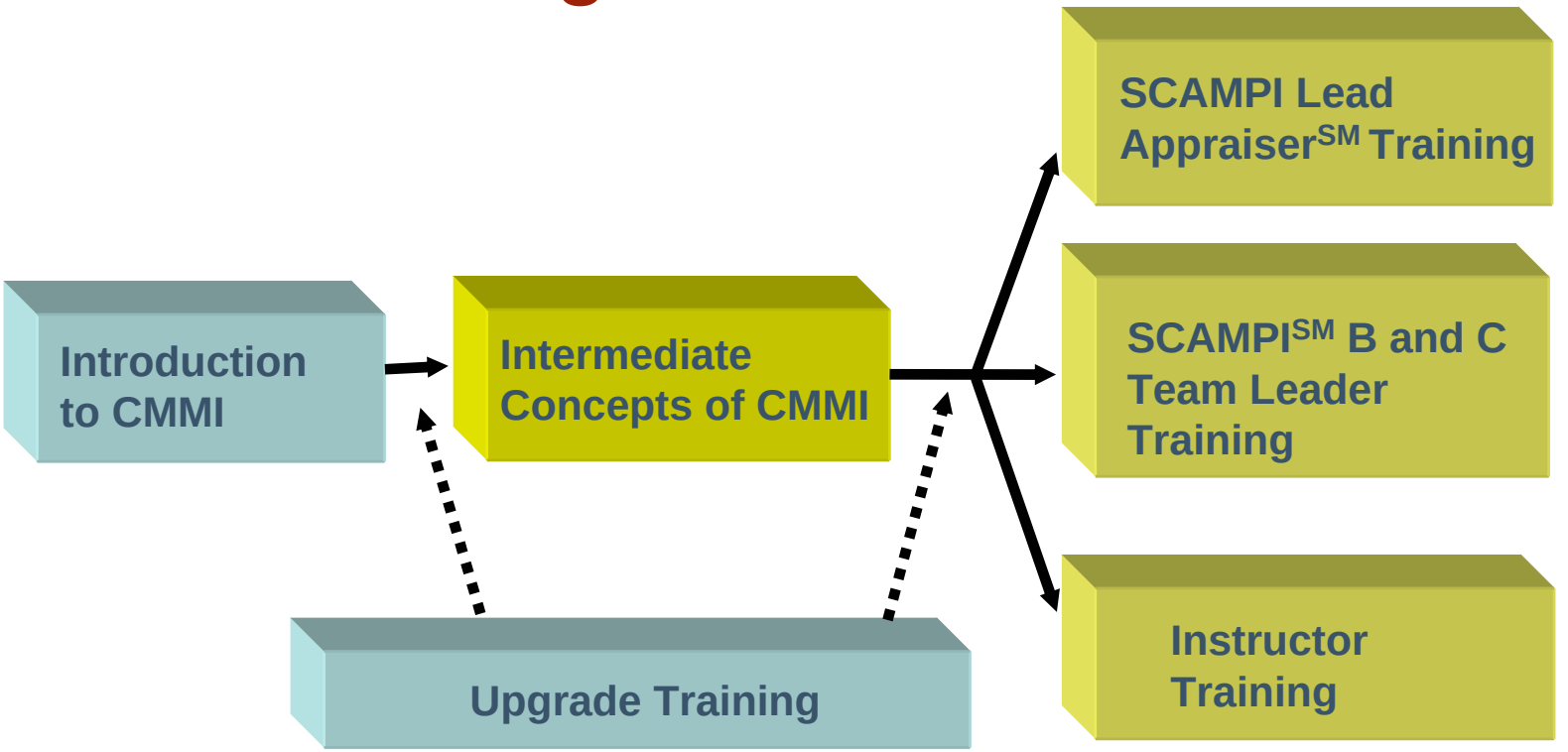
- reduce complexity and ambiguity
- provide additional guidance where needed
- strengthen appraisal planning and conduct
- strengthen appraisal reporting
- define the appraisal validity period
- strengthen lead appraiser requirements

The changes are intended to make appraisals more accurate, reliable, and efficient.

Purpose

The purpose of this module is to describe the major changes to the CMMI Training for v1.2.

SEI Training for CMMI



CMMI Training Changes

The Introduction to CMMI course was updated to address change requests and to address CMMI Product Suite v1.2 changes.

The following courses will be updated in Fall 2006 to address change requests and CMMI Product Suite v1.2 changes:

- Intermediate Concepts of CMMI
- CMMI Instructor Training
- SCAMPI Lead Appraiser Training
- SCAMPI B and C Team Leader Training

CMMI v1.2 Upgrade Training was also developed to help users move from v1.1 to v1.2

Topics

Introduction to CMMI

Intermediate Concepts of CMMI

Instructor Training

SCAMPI Training

Examinations

Major Changes to the Introduction to CMMI Course

The major changes to the Introduction to CMMI, v1.2 course focused on three areas:

- course content
- exercises
- course reference

Course Content[1]

The benefits associated with adopting CMMI were updated.

Information about CMMI benefits is available in the SEI technical report, *Performance Results of CMMI-Based Process Improvement* (CMU/SEI-2006-TR-004). It is available on the SEI Web site at http://www.sei.cmu.edu/publications/documents/06.reports/06tr004.html.

Course Content²

Material related to the following was removed:

- advanced and base practices
- common features

Material related to the following was added or changed:

- How PAs support the implementation of generic practices was updated. (The basis for this material can be found in Figure 6.2 in the model.)
- The "Sampling Generic Practices" slides now collectively include all generic practices, and reference capability and maturity levels.
- Information on the CMMI architecture was added.

Course Content[3]

These changes were also made to reflect changes in the model:

- Integrated Supplier Management was removed and two specific practices were moved to Supplier Agreement Management.
- Organizational Environment for Integration and Integrated Teaming were removed and material was moved to Organizational Process Definition and Integrated Project Management.
- Two new practices were added to cover work environment–one in Organizational Process Definition and one in Integrated Project Management.
- A third goal was added to Organizational Process Focus to address the deployment of organizational process assets.

There are now 22 PAs discussed in the course.

Exercises

Exercise 1, “Important Process Improvement Ideas,” and Exercise 7, “Measurement Implications of Your Process Improvement Goals,” were simplified.

Exercises were updated to reflect the removal of some PAs.

Other minor editorial changes were made.

Course Reference

The course was designed so that the reference model used can be either

- the technical report, *CMMI for Development, Version 1.2*
- the Addison-Wesley book, *CMMI: Guidelines for Process Integration and Product Improvement, Second Edition*

Topics

Introduction to CMMI

Intermediate Concepts of CMMI

Instructor Training

SCAMPI Training

Examinations

Major Changes to Intermediate Concepts of CMMI

The major changes to the Intermediate Concepts of CMMI course will focus on four areas:

- course format
- exercises
- student presentations
- course content

Editorial changes also will be made to correct identified errors.

Course Format

The format of the Intermediate Concepts of CMMI course will change.

In the v1.1 course, the instructor presented material the first day and on following days the students presented. In v1.2, student presentations, exercises, and SEI instructor presentations will be intermixed throughout the week to provide a better balance.

TOEFL* requirements will now be used as part of the registration process.

*Test of English as a Foreign Language

Course Content

The majority of changes to the course slides will reflect the changes from CMMI v1.2 model.

In addition, the following changes will be made:

- Material on application and interpretation will be added.
- There will be more emphasis on institutionalization (i.e., generic goals and generic practices).

Exercises

All exercises will be updated to better meet the course objectives.

Several exercises will be integrated with a common theme so that concepts are developed using related exercises that build on each other throughout the course.

Student Presentations

The student presentations will be modified to better meet the course objectives.

- The process used for assigning student presentation topics will be revised. More information will be collected from students to help to better assign the PAs.
- The length of student presentations will be reduced.
- Slides for instructors will be provided to reinforce the key points of each PA.

Topics

Introduction to CMMI

Intermediate Concepts of CMMI

Instructor Training

SCAMPI Training

Examinations

Major Changes to Instructor Training

The major changes to the Instructor Training course will focus on two areas:

- course content
- student presentations

Course Content

Changes to all course materials will be made to reflect the changes to:

- the Introduction to CMMI course
- the CMMI v1.2 model

The sections that will be revised include:

- the course structure and key concepts section
- the review of CMMI topics section

Editorial changes will be made to correct identified errors.

Student Presentations

The following changes will be made:

- The assignments will be updated to reflect changes in the model (e.g., delete presentation assignments related to the PAs that were removed from the model).
- Add a teaching assignment focused on topics such as
  - model components
  - generic goals and generic practices
  - capability levels and maturity levels
  - benefits of process improvement
  - PA-to-PA relationships

Topics

Introduction to CMMI

Intermediate Concepts of CMMI

Instructor Training

SCAMPI Training

Examinations

Major Changes to SCAMPI Training

The changes to the SCAMPI Lead Appraiser Training and SCAMPI B and C Team Leader Training courses will focus on two areas:

- course content
- exercises

Course Content

The majority of changes to the course slides will reflect the changes from SCAMPI v1.2.

In addition, material will be added on ethics and model interpretation.

Exercises

The majority of changes to the course exercises will be made to reflect the CMMI for Development, Version 1.2.

Topics

Introduction to CMMI

Intermediate Concepts of CMMI

Instructor Training

SCAMPI Training

Examinations

Examinations

The construction and format of examinations have changed. v1.1 tests were largely short answer tests that were the same for all students.

For v1.2, tests will be generated from an item bank and now will be multiple choice. CMMI v1.2 Upgrade Training for Instructors, Lead Appraisers, and Team Leaders is the first course to use this approach. The Intermediate Concepts of CMMI and Instructor Training will follow.

Multiple Choice Examinations

This new approach, using an item bank and multiple choice questions, allows multiple versions of examinations that can be constructed more easily:

- The sequence of multiple choice responses can vary from test to test.
- The order of questions can vary from test to test.
- The selection of questions can vary from test to test, but cover the same categories.

This new approach allows us to

- add, modify, and delete questions from the test more easily
- better evaluate the student's knowledge

Summary

Many changes were made to the CMMI training courses to improve quality and reflect changes to the CMMI Product Suite:

- CMMI for Development, Version 1.2
- SCAMPI v1.2
- Introduction to CMMI, v1.2

For More Information…

For more information about CMMI

- http://www.sei.cmu.edu/cmmi/ (main CMMI site)

Other Web sites of interest include

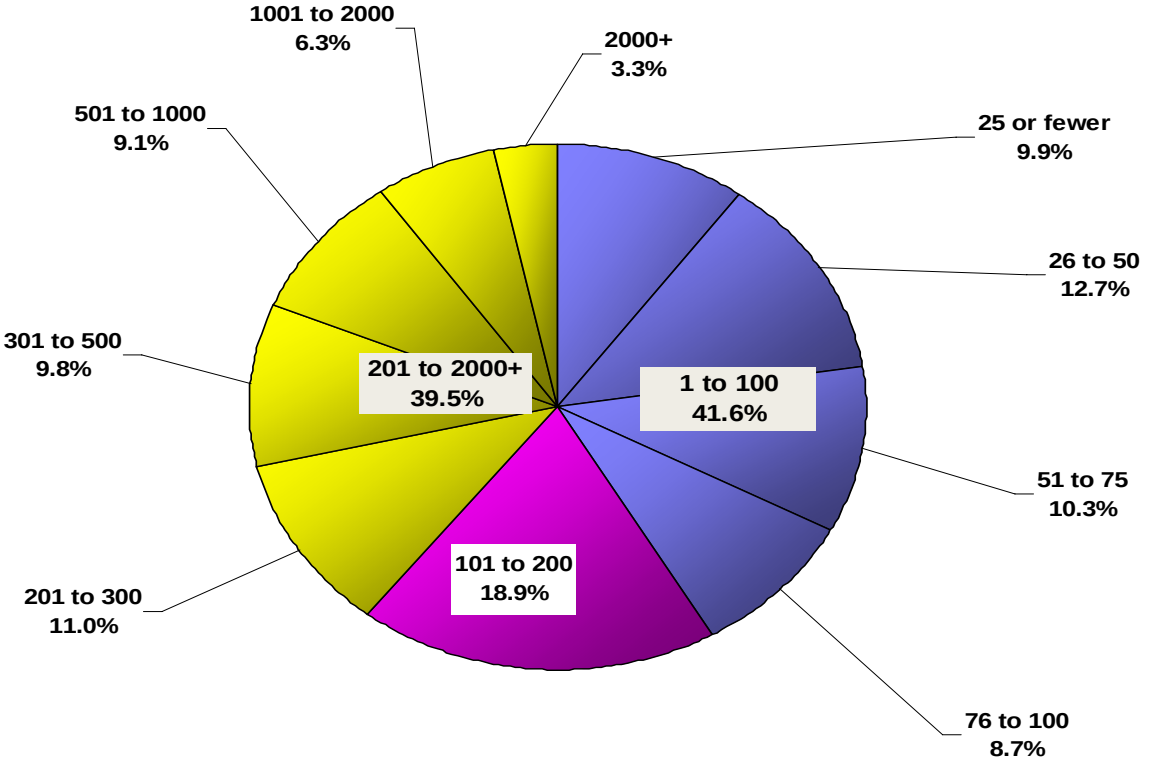
- http://seir.sei.cmu.edu/seir/ (Software Engineering Information Repository)
- http://dtic.mil/ndia (annual CMMI Technology Conferences)
- http://seir.sei.cmu.edu/pars (publicly released SCAMPI appraisal summaries)
- https://bscw.sei.cmu.edu/pub/bscw.cgi/0/79783

Or, contact

SEI Customer Relations
Phone: 412 / 268-5800
Email: customer-relations@sei.cmu.edu

Organization Size

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



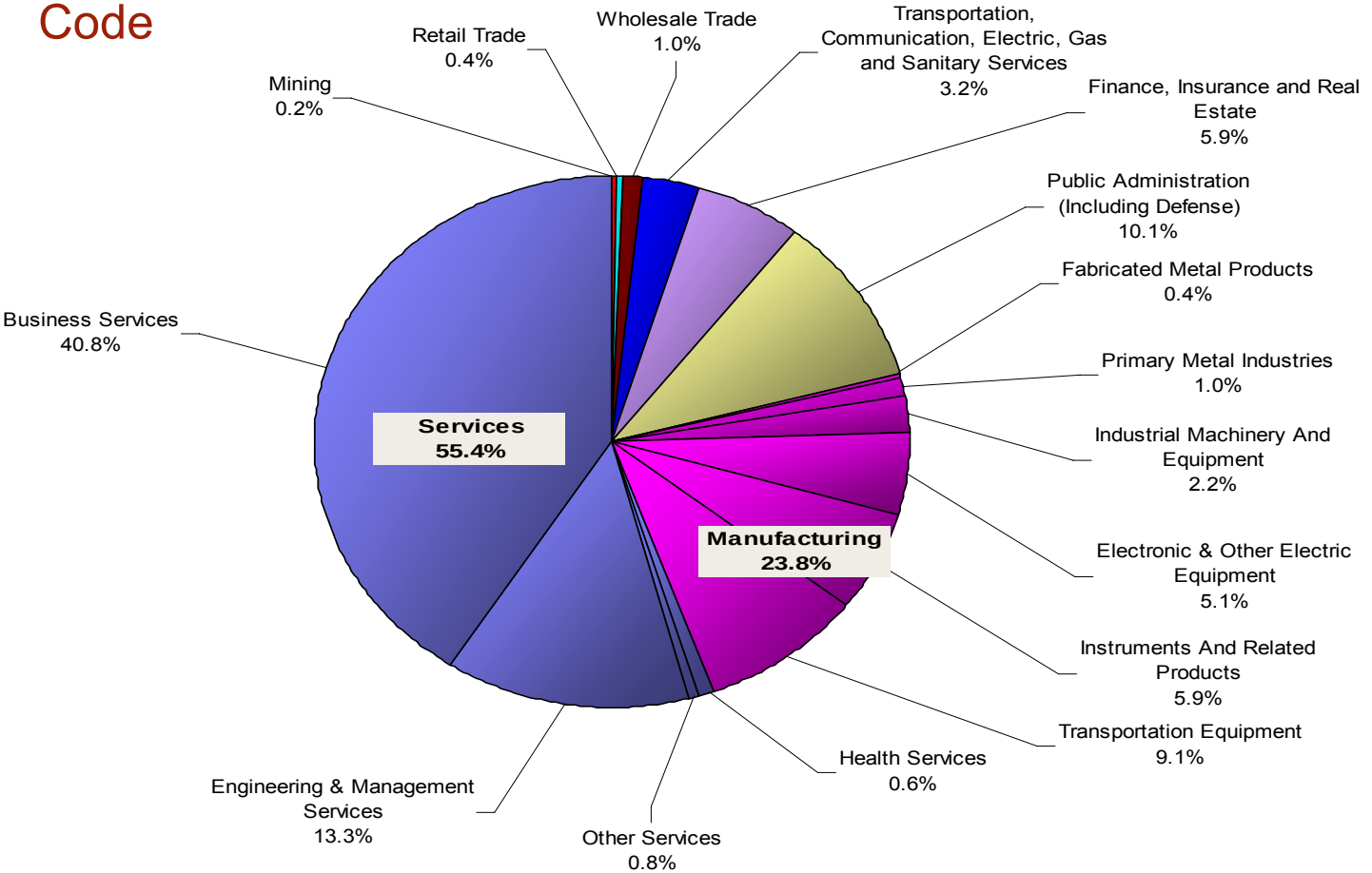
Based on **1,083** organizations reporting size data

Appraisals and Maturity Levels by Country

Country	Number of Appraisals	Maturity Level 1 Reported	Maturity Level 2 Reported	Maturity Level 3 Reported	Maturity Level 4 Reported	Maturity Level 5 Reported	Country	Number of Appraisals	Maturity Level 1 Reported	Maturity Level 2 Reported	Maturity Level 3 Reported	Maturity Level 4 Reported	Maturity Level 5 Reported
Argentina	12	No	Yes	Yes	Yes	No	Latvia	10 or fewer					
Australia	21	Yes	Yes	Yes	Yes	Yes	Malaysia	10 or fewer					
Austria	10 or fewer						Mauritius	10 or fewer					
Belarus	10 or fewer						Mexico	10 or fewer					
Belgium	10 or fewer						Netherlands	10 or fewer					
Brazil	22	No	Yes	Yes	No	Yes	New Zealand	10 or fewer					
Canada	15	No	Yes	Yes	No	Yes	Philippines	10					
Chile	10 or fewer						Portugal	10 or fewer					
China	117	Yes	Yes	Yes	Yes	Yes	Russia	10 or fewer					
Colombia	10 or fewer						Singapore	10 or fewer					
Czech Republic	10 or fewer						Slovakia	10 or fewer					
Denmark	10 or fewer						South Africa	10 or fewer					
Egypt	10 or fewer						Spain	18	No	Yes	Yes	No	Yes
Finland	10 or fewer						Sweden	10 or fewer					
France	42	Yes	Yes	Yes	Yes	Yes	Switzerland	10 or fewer					
Germany	22	Yes	Yes	Yes	No	Yes	Taiwan	26	No	Yes	Yes	No	No
Hong Kong	10 or fewer						Thailand	10 or fewer					
India	140	No	Yes	Yes	Yes	Yes	Turkey	10 or fewer					
Ireland	10 or fewer						Ukraine	10 or fewer					
Israel	10 or fewer						United Kingdom	35	Yes	Yes	Yes	Yes	No
Italy	10 or fewer						United States	500	Yes	Yes	Yes	Yes	Yes
Japan	131	Yes	Yes	Yes	Yes	Yes	Vietnam	10 or fewer					
Korea, Republic of	50	Yes	Yes	Yes	Yes	Yes							

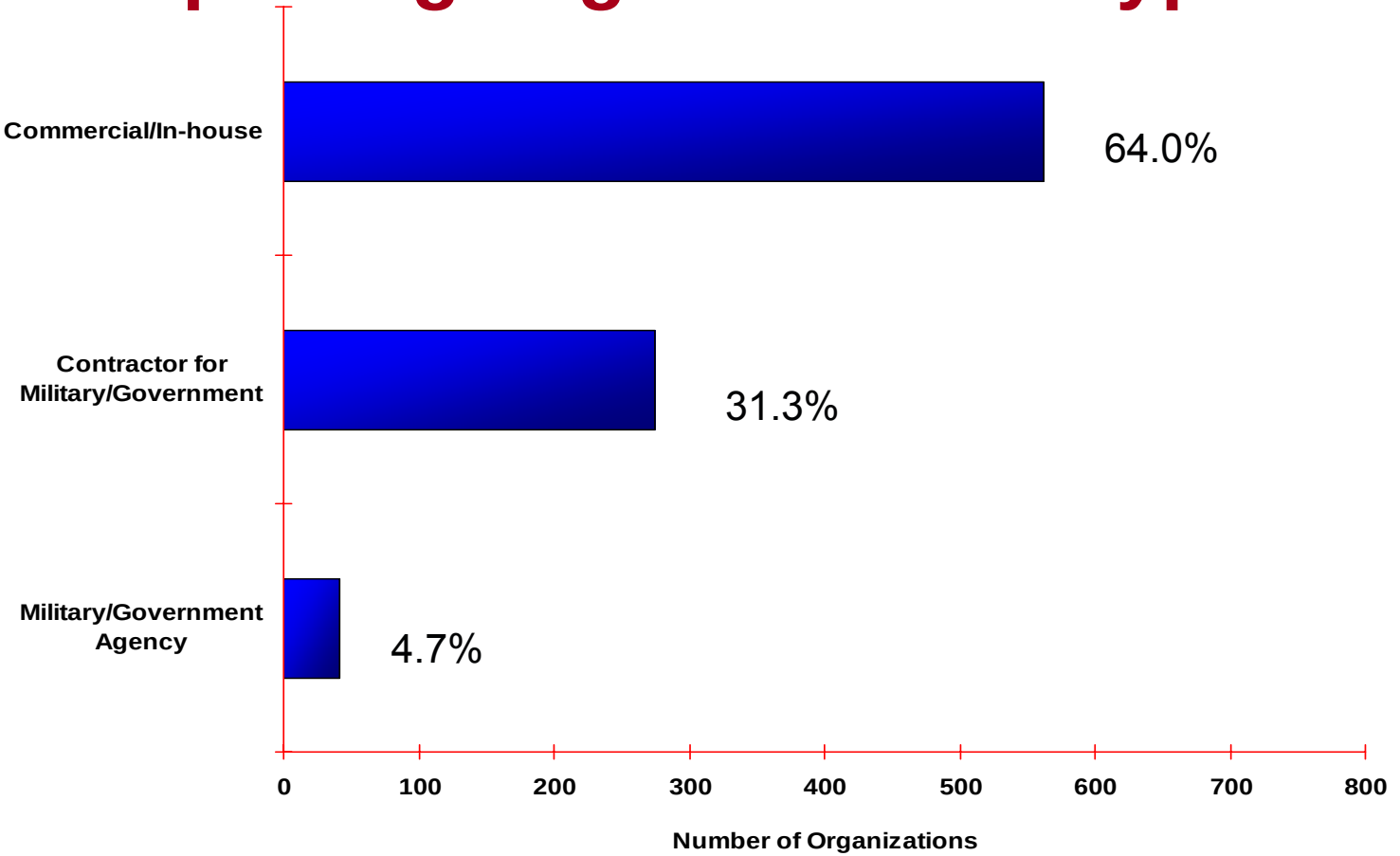
Organization Type

Based on Primary Standard Industrial Classification (SIC) Code



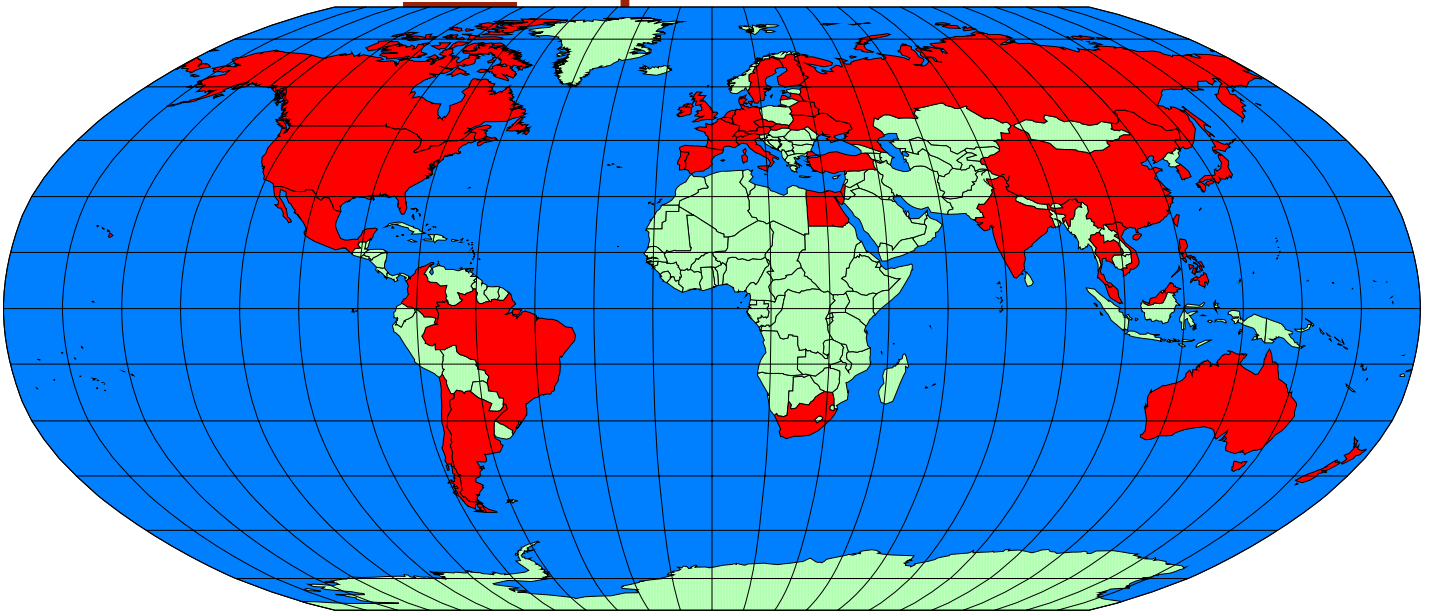
Based on **505** organizations reporting SIC code. For more information visit: http://www.osha.gov/oshstats/sicser.html

Reporting Organizational Types



Based on **878** organizations

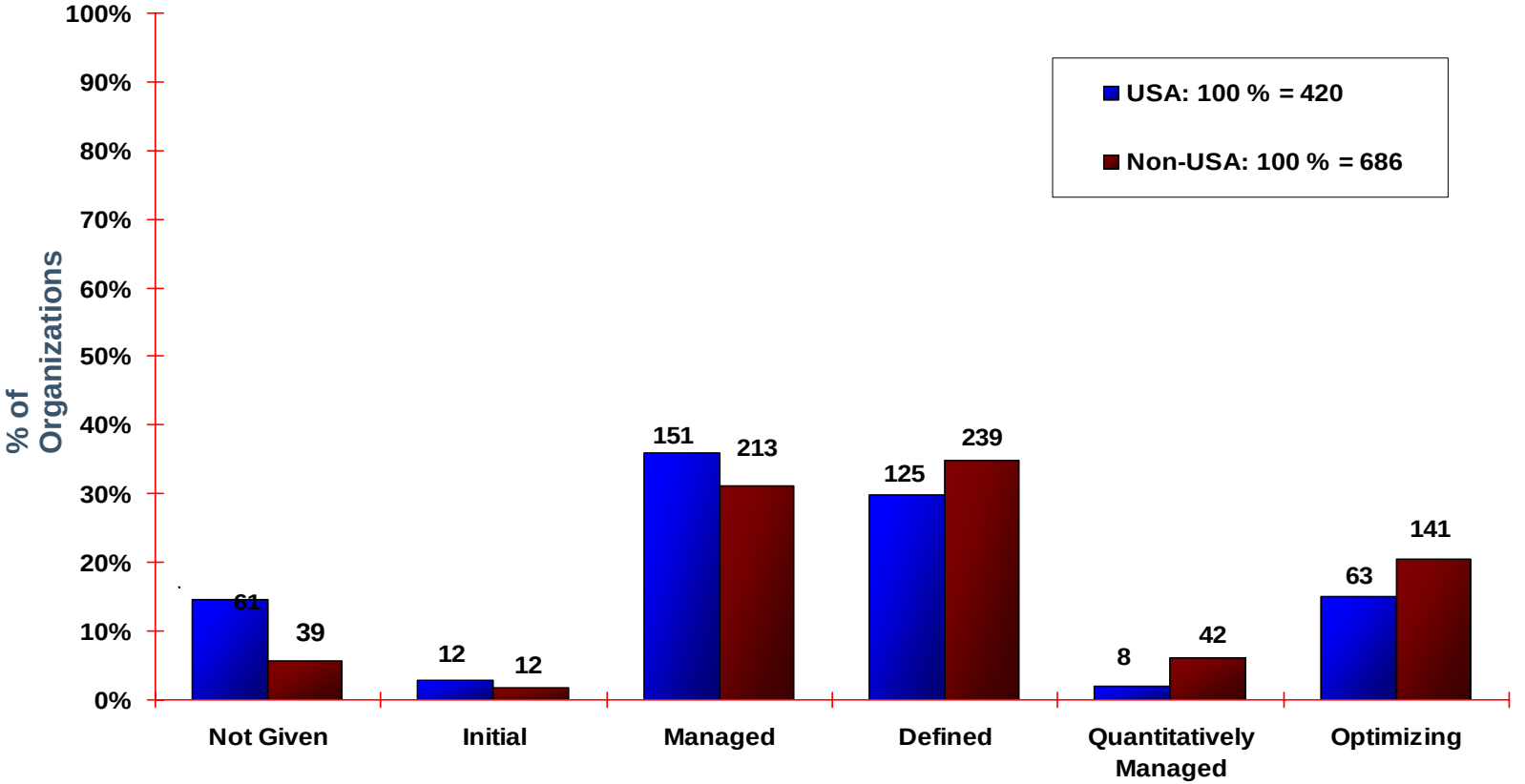
Countries where Appraisals have been Performed and Reported to the SEI



Argentina	Australia	Austria	Belarus	Belgium	Brazil	Canada
Chile	China	Colombia	Czech Republic	Denmark	Egypt	Finland
France	Germany	Hong Kong	India	Ireland	Israel	Italy
Japan	Korea, Republic of	Latvia	Malaysia	Mauritius	Mexico	Netherlands
New Zealand	Philippines	Portugal	Russia	Singapore	Slovakia	South Africa
Spain	Sweden	Switzerland	Taiwan	Thailand	Turkey	Ukraine
United Kingdom	United States	Vietnam				

Red country name: New additions since October 2005

Maturity Profile by All Reporting USA and Non-USA Organizations



Based on **420** USA organizations and **686** Non-USA organizations