CMMI® Update
February 23, 2009

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Your Presenters

• Program Manager for CMMI

• He was previously responsible for Transition Enabling activities at the SEI. He has authored Technical Reports, Technical Notes, CMMI Columns, and various articles in addition to presenting CMMI material at conferences around the world.

• Prior to his retirement as a colonel from the Air Force, he managed the $36B development program for the B-2 in the B-2 SPO and commanded the 4950th Test Wing at Wright-Patterson AFB, OH.

• 30+ years S&SW R&D, management, development

• SEI, R&D organizations, industry

• With the SEI since 1988

• Recent Focus: High Maturity, Agile methods

• Model Manager, Chief Architect
Organizations Are Complex Systems

Adapted from Kast and Rosenzweig, 1972.
“M” is for Model

“All models are wrong; some models are useful.” George Box
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!
SEI’s IDEAL Approach
### CMMI Transition Status
Reported to the SEI as of 1-31-09

#### Training

<table>
<thead>
<tr>
<th>Course</th>
<th>Participants</th>
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</thead>
<tbody>
<tr>
<td>Introduction to CMMI</td>
<td>97,832</td>
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<tr>
<td>Intermediate CMMI</td>
<td>2,877</td>
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<tr>
<td>Understanding CMMI High Maturity Practices</td>
<td>528</td>
</tr>
<tr>
<td>Introduction to CMMI V1.2 Supplement for ACQ</td>
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<td>On-line Intro. to CMMI V1.2 Supplement for ACQ</td>
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<tr>
<td>Introduction to CMMI V1.2 Supplement for SVC</td>
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#### Authorized / Certified

<table>
<thead>
<tr>
<th>Role</th>
<th>Participants</th>
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<tr>
<td>Introduction to CMMI V1.2 Instructors</td>
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<tr>
<td>SCAMPI V1.2 Lead Appraisers</td>
<td>498</td>
</tr>
<tr>
<td>SCAMPI V1.2 B&amp;C Team Leaders</td>
<td>510</td>
</tr>
<tr>
<td>V1.2 High Maturity Lead Appraisers</td>
<td>145</td>
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<tr>
<td>CMMI-ACQ V1.2 Instructors</td>
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<tr>
<td>CMMI-ACQ V1.2 Lead Appraisers</td>
<td>42</td>
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</table>
SCAMPI v1.1/v1.2 Class A Appraisals
Conducted by Quarter
Reported as of 1-31-09
CMMI Adoption Has Been Broad

25 countries with 10 or more appraisals (Aug 06 -> Jul 08):

- USA 598 -> 1034
- China 158 -> 465
- India 177 -> 323
- Japan 155 -> 220
- France 65 -> 112
- Korea (ROK) 56 -> 107
- Taiwan 31 -> 88
- Brazil 39 -> 79
- Spain 25 -> 75
- U.K. 42 -> 71
- Germany 28 -> 51
- Argentina 15 -> 47
- Canada 18 -> 43
- Malaysia 15 -> 42
- Mexico <10 -> 39
- Australia 23 -> 29
- Egypt 10 -> 27
- Chile <10 -> 20
- Philippines 14 -> 20
- Colombia <10 -> 18
- and Italy, Israel, Singapore, Hong Kong, and Pakistan

Est’d 900,000+ work in orgs that have had a SCAMPI A appraisal.

- SCAMPI A reports from 60 countries
- 72% of adopters are commercial orgs
- 2/3 Services; 1/5 Manufacturing
- Approx. 70% of adopters in US are contractors for military/gov’t or are gov’t

http://www.sei.cmu.edu/appraisal-program/profile/profile.html
Statistical analyses by the presenter.
# CMMI V1.2 Foreign Language Translation Status
Reported to the SEI as of 1-31-09

## CMMI-DEV V1.2

<table>
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<tr>
<th>Language</th>
<th>Status</th>
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<tr>
<td>Chinese (Simplified)</td>
<td>Underway, to be completed in 2009</td>
</tr>
<tr>
<td>Chinese (Traditional)</td>
<td>Completed December 2007</td>
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<tr>
<td>French</td>
<td>Completed August 2008</td>
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<tr>
<td>German</td>
<td>To be completed in March 2009</td>
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<tr>
<td>Italian</td>
<td>Awaiting application and plan.</td>
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<tr>
<td>Japanese</td>
<td>Completed August 2007. Intro course translated</td>
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<td></td>
<td>October 2007</td>
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<tr>
<td>Portuguese</td>
<td>To be completed by 2009</td>
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<tr>
<td>Spanish</td>
<td>Underway, to be completed in 2009</td>
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## CMMI-ACQ V1.2

<table>
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<th>Language</th>
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</thead>
<tbody>
<tr>
<td>Chinese (Traditional)</td>
<td>Underway, to be completed in March 2009</td>
</tr>
</tbody>
</table>
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  Hong Kong  Hungary  India
Indonesia  Ireland  Israel  Italy  Japan  Korea, Republic Of  Latvia  Malaysia
Mauritius  Mexico  Morocco  Netherlands  New Zealand  Norway  Pakistan  Peru
Philippines  Poland  Portugal  Romania  Russia  Saudi Arabia  Singapore  Slovakia
South Africa  Spain  Sweden  Switzerland  Taiwan  Thailand  Turkey  Ukraine
United Arab Emirates  United Kingdom  United States  Uruguay  Viet Nam
Beyond CMMI V1.2...
3 Complementary “Constellations”

- **CMMI-SVC**: Provides guidance for those providing services within organizations and to external customers.
- **CMMI-Dev**: Provides guidance for measuring, monitoring, and managing development processes.
- **16 Core Process Areas, common to all**
- **CMMI-ACQ**: Provides guidance to enable informed and decisive acquisition leadership.
CMMI-ACQ v1.2
Acquisition Category Process Areas

CMMI Model Framework (CMF)
16 Project, Organizational, and Support Process Areas

- Solicitation & Supplier Agreement Development
- Agreement Management
- Acquisition Requirements Development
- Acquisition Technical Management
- Acquisition Verification
- Acquisition Validation
Visibility into the Team’s Capability

CMMI for Acquisition
- Acquisition Planning
- RFP Prep.
- Solicitation
- Source Selection
- Program Leadership Insight / Oversight
- System Acceptance
- Transition

CMMI for Development
- Plan
- Design
- Develop
- Integrate & Test
- Deliver

Operational Need

Acquirer

Developer
CMMI-SVC v0.5(+)

16 Core Process Areas
and 1 shared PA (SAM)

Capacity and Availability Management
Service Continuity
Service System Development
Strategic Service Management
Incident Resolution & Prevention
Service Delivery
Service System Transition
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.)
Planned Elements – Multi-Model

- Improving the interfaces is of interest to both government and industry....
Multiple models complicate process improvement – but make it much more powerful by addressing specific needs in various environments....
Planned Sequence of Models
CMMI Version 1.3
Product Suite: What May Change
CMMI Product Suite, Version 1.3¹

• “Version 1.3 will focus upon but not be limited to:
  • High Maturity
  • More effective GPs
  • Appraisal efficiency
  • Consolidation across Constellations”
• (per criteria documented by the CMMI Steering Group)
• Version 1.3 will be Change Request (CR) driven.
  • Events such as “Beyond Version 1.2,” “Future Directions,” and this webinar are for information sharing and dialogue
  • But every change must trace back to a Change Request (CR)
In this Webinar, we present some ideas around certain topics.

For selected topics, we will briefly discuss:

- Our initial ideas on the topic
- Pros/Cons

For selected ideas, we may poll you for your preference:

- Candidate questions (we’ll ask as time permits) are in green font

The poll will give us insight into the will of the community.

But you must submit a CR to be sure you are heard!!
High Maturity Topics

• Overall goal: improve clarity of HM practices

• Introduce a lower-ML version of CAR

• Show Practice Evolution through Amplifications
Overall Goal: Improve Clarity of HM Practices

- Problem statement:
  - HM practices are currently unclear, leading to a variety of interpretations
- The goal in a nutshell:
  - All CMMI users have a common understanding of the HM Practices
- Involves:
  - Reviewing CRs from the Sept. 23-24, 2008 HMLA Workshop
  - Clarifying connection between statistical management of subprocesses and project management
  - Increase depth and clarity of CAR and OID practices
  - Improving/clarifying terminology
  - Aligning required, expected, and informative
    - Also, clarify the role of informative material in the model
  - Adding additional notes and examples describing typical “how to’s”
Introduce a lower-ML version of CAR

- Problem statement:
  - Causal Analysis is viewed as valuable at any ML
    - Use of OSSP, and PDP does ‘stabilize’ performance to a degree
    - ML3 basis can assure some uniformity of impact
    - May not be able to distinguish special from common causes of variation
- The goal in a nutshell:
  - Create a lower ML version of CAR (e.g., as an SP[s] in IPM).
- Involves:
  - Strengthening CAR at ML 5
  - Introducing practices (e.g., IPM) addressing causal analysis at ML 3

- Should we introduce a ‘lower maturity’ version of CAR?
  - A. Yes.  B. Don’t care.  C. No
Show Practice Evolution through Amplifications

- Problem statement:
  - Some see ML 2-3 practices as static – not evolving as ML increases
- The goal in a nutshell:
  - Make it easier for an organization to interpret the practices as the organization matures.
- Involves:
  - Reviewing lower-ML practices for instances where an amplification would clarify how the practice “matures” at levels 4 and 5 (e.g., PP)
  - Inserting clearly-delimited amplifications in lower-ML PAs
More Effective GPs Topics

- Overall goal: simplify the GPs
- Reducing the GG 2 GPs to a Few
- Clarifying role of measurement in GP 2.8
- Improving the Clarity of GP 3.2
- Eliminating Generic Practices at CL 4-5
Overall Goal: Simplify the GPs

- Problem Statement:
  - GPs have a multiplier effect on # of items that need to be addressed
    - GPs greatly affect the # of artifacts needed for an appraisal
    - If a GP is misunderstood, every PA is affected
  - Redundancy: Almost all GPs have associated PAs

- The goal in a nutshell:
  - Simplify the GPs

- Involves:
  - Reviewing the need for GG 1, GG 4-5, and their GPs
  - Reducing the # of GPs at CL 2 (which are more important?)
  - Rewording problematic GPs (per Pat O’Toole’s ATLAS surveys)
  - Clarifying that GPs can be implemented at single or multiple organizational or project levels, or both, depending on the PA.
Reducing the GG 2 GPs to a Few

- We may propose reducing the GPs under GG 2 to just a few:
  - GP 2.1 Policy
  - GP 2.2 Plan the Process
  - GP 2.8 Monitor and Control the Process (revised to incorporate GP 2.10 Higher-level management)

- Previous webinar feedback suggests the above may be too few.

- Would you:
  A. Add 2.3 Resources?
  B. Add 2.9 Adherence?
  C. Keep 2.10 separate?
  D. None
Clarifying Role of Measurement in GP 2.8

- Measuring the process should be seen as a means (as opposed to the means) to monitoring and controlling the process

  - GP 2.8 was never intended to require a measure for every PA

  - Informative material should be updated to clarify this

  - But if no measures are ever involved in monitoring and controlling the process for any PA, this should raise a “red flag”
Improving the Clarity of GP 3.2

- Propose rewording GP 3.2 from:
  - “Collect work products, measures, measurement results, and improvement information derived from planning and performing the process to support the future use and improvement of the organization’s processes and process assets”
  - to:
  - “Collect information derived from planning and performing the process to support the future use and improvement of the organization’s processes.”

- Replace “information” with:
  A. “information”
  B. “measurements”
  C. “measurements and other information”
Eliminating Generic Practices at CL 4-5

- Problem statement:
  - CL 4-5 GPs inadequately cover PAs with which they are associated
  - Used in only a minority of appraisals
    - Not necessary for Staged representation
  - Encourage suboptimization
- The goal in a nutshell:
  - Remove the CL 4-5 GPs until a broad and shared understanding of the associated PAs at ML4-5 is achieved.
- Involves:
  - Simplifying institutionalization discussion for both representations (e.g., equivalent staging)

- Should the CL 4-5 GPs be eliminated from V1.3?
  - A. Yes.  B. Don’t care.  C. No
Appraisal Efficiency

- Possible changes to the model to improve efficiency include:
  - Simplifying # of GPs (see earlier slides)
  - Resolve practice ambiguities
    - E.g., PP SP 1.1, “Establish … WBS to estimate … scope …”
  - Make applicability of SPs more “solid” (e.g., evaluating supplier processes)

- Refinements to SCAMPI itself include:
  - Using directed sampling (during Discovery)
    - Constructing an appropriate indicator set (rotating, random)
    - Readiness review (ensuring indicators have been identified)
  - Using Inverted PIIDs (as an option, not a requirement)?
    - Documents tagged with all the SPs and GPs they map to
Consolidation Across Constellations

- Overall goal:
  - Achieve balance between:
    - “Naturalness” of model content within each area of interest
    - Commonality of model content across constellations
  - Help ensure CMMI Models are usable in combination
  - Provide clarity as to what is specific to an area of interest vs. common
- Reference:
  - CMMI-DEV V1.2, CMMI-ACQ V1.2, forthcoming CMMI-SVC V1.2
- Involves:
  - Applying DAR to evaluate alternatives, e.g.:
    - The 16 Core PAs can only differ in notes and examples
    - The 16 Core PAs can differ in goals and practices but not ML etc.
  - Implementing the selected alternative
Consolidation Across Constellations

• Will your org’n be using multiple CMMI models?
  A. No
  B. DEV+ACQ
  C. DEV+SVC
  D. SVC+ACQ
  E. All 3
Consolidation Across Constellations

- Covering Integrated/Self-Directed Teams in CMMI:
  - In CMMI-DEV, this topic is optional but at goal level (OPD SG 2, IPM SG 3)
  - In CMMI-ACQ, this topic is expected (OPD SP 1.7, IPM SP 1.6)
  - People CMM has considerable material on teams

- Definitions
  - IPT = Integrated Product Team (all disciplines having a significant role in product lifecycle are represented on IPT)
  - Self-directed team = A team that establishes its own plans and processes; measures, analyzes, and improves its performance; and adjusts in response to change

- Select type of team (A) and how included (B)
  - A1. IPT B1. Optional as in DEV
  - A2. Self-directed B2. Expected as in ACQ, SVC
  - A3. Both
Consolidation Across Constellations

- Some reviewers of CMMI-SVC model drafts have proposed adding these PAs (with appropriate wording changes) to DEV and ACQ:
  - Capacity and Availability Management (CAM)
    - The purpose of CAM is to ensure effective service system performance and ensure that resources are provided and used effectively to support service requirements.
  - Service Continuity (SCON)
    - The purpose of SCON is to establish and maintain plans to ensure continuity of services during and following any significant disruption of normal operations.

- Should we add to DEV and ACQ?
  A. Neither
  B. CAM
  C. SCON
  D. Both
Miscellaneous Topics

- Multiple model implementations
- Agile methods
- “Lean” the Model
- Additional Guidance
Multiple Model Implementations

• The goal in a nutshell:
  • Enable organizations to implement multiple models, frameworks, etc.
• Reference:
  • Jeannine Siviy’s and Patrick Kirwin’s SEI Webinar, “Process Improvement in Multi-Model Environments (PrIME),“ July 2008
• Involves:
  • Ensuring CMMI constellations have common Architecture & Glossary
  • A methodology to efficiently trace to multiple frameworks
Agile Methods

• The goal in a nutshell:
  • Enable CMMI and Agile users to make synergistic use of both

• Reference:

• Involves:
  • Inserting notes that help adopters of Agile methods correctly interpret practices (e.g., evaluating alternative technical solutions [TS SG 1])
“Lean” the Model

- The goal in a nutshell:
  - Make the essence of the “underlying model” visible
- Reference:
  - Results of Beyond V1.2 Workshops
- Involves:
  - Identifying material that does not need to be in the model
  - Moving this material to a Web page, Wiki, or separate technical note
  - Making the external material easy to locate
  - Eliminating/consolidating low-value practices
- Example:
  - Move the GP Elaborations out of the model and into supplementary material
Provide Additional Guidance

• The goal in a nutshell:
  • Identify particular challenges (or opportunities) affecting the CMMI user community that complicate interpretation and implementation of CMMI practices
  • Make additional guidance, notes, and examples available (not necessarily within the model)

• Should V 1.3 cover:
  A. 6 Sigma, Lean
  B. OPM3
  C. People CMM
  D. COTS, GOTS
  E. System-of-system
Summary

• This is your last opportunity to influence Version 1.3!
• Four drivers for Version 1.3:
  • Clarify high maturity, simplify GPs, increase appraisal efficiencies, and improve commonality across the constellations.
• But we need your CRs!
  • Submitted no later than March 2, 2009
  • URL is given on the last slide.
• Thank you for participating in this Webinar!
• And to those who participated in:
  — the NDIA or SEI-led “Beyond V1.2 Workshops” in 2007 and 2008
  — “Future Directions” Workshops in 2008
• And thank you to those participating in the brainstorming & CR review
  — Lynn Penn of Lockheed Martin
  — Rhonda Brown, Mike Phillips, Charlie Ryan, and Sandy Shrum of SEI
What Have We Missed?

- Please submit your CRs:
  - http://www.sei.cmu.edu/cmmi/models/change-requests.html