Capability Maturity Model®
Integration (CMMI®) Version
1.2 Overview
Topics

Common Process Problems
- Process Improvement Basics
- Process Models
- The CMMI Concept
- Appraisals and Training
- The Benefits of Using CMMI
- CMMI Adoption
- The Bottom Line
Settling for Less

Do these statements sound familiar? If they do, your organization may be settling for less than it is capable of and may be a good candidate for process improvement.

“I'd rather have it wrong than have it late. We can always fix it later.”

- a senior software manager (industry)

“The bottom line is schedule. My promotions and raises are based on meeting schedule first and foremost.”

- a program manager (government)
Symptoms of Process Failure

Commitments consistently missed
- Late delivery
- Last minute crunches
- Spiraling costs

No management visibility into progress
- You’re always being surprised

Quality problems
- Too much rework
- Functions do not work correctly
- Customer complaints after delivery

Poor morale
- People frustrated
- Is anyone in charge?
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Common Process Problems

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The Process Management Premise

The quality of a system is highly influenced by the quality of the process used to acquire, develop, and maintain it.

This premise implies a focus on processes as well as on products.

- This is a long-established premise in manufacturing (and is based on TQM principles as taught by Shewhart, Juran, Deming, and Humphrey).
- Belief in this premise is visible worldwide in quality movements in manufacturing and service industries (e.g., ISO standards).
Quality Leverage Points

While process is often described as a node of the process-people-technology triad, it can also be considered the “glue” that ties the triad together.

Everyone realizes the importance of having a motivated, quality work force but even our finest people cannot perform at their best when the process is not understood or operating at its best.

Process, people, and technology are the major determinants of product cost, schedule, and quality.
Common Misconceptions

I don’t need process, I have
  • really good people
  • advanced technology
  • an experienced manager

Process
  • interferes with creativity
  • equals bureaucracy + regimentation
  • isn’t needed when building prototypes
  • is only useful on large projects
  • hinders agility in fast-moving markets
  • costs too much
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What Is a Process Model?

A process model is a structured collection of practices that describe the characteristics of effective processes.

Practices included are those proven by experience to be effective.
Why Is a Process Model Important?

A process model provides

- a place to start improving
- the benefit of a community’s prior experiences
- a common language and a shared vision
- a framework for prioritizing actions
- a way to define what improvement means for an organization
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CMMI for Process Improvement -1

Use CMMI in process improvement activities as a

- collection of best practices
- framework for organizing and prioritizing activities
- support for the coordination of multi-disciplined activities that might be required to successfully build a product
- means to emphasize the alignment of the process improvement objectives with organizational business objectives

CMMI incorporates lessons learned from use of the SW-CMM®, EIA-731, and other standards and models.
A CMMI model is not a process.
A CMMI model describes the characteristics of effective processes.

“All models are wrong, but some are useful.”
George Box
(Quality and Statistics Engineer)
The CMMI Framework

The CMMI Framework is the structure that organizes the components used in generating models, training materials, and appraisal methods.

The CMMI Product Suite is the full collection of models, training materials, and appraisal methods generated from the CMMI Framework.

The components in the CMMI Framework are organized into groupings, called constellations, which facilitate construction of approved models.

- During v1.2 development, CMMI-SE/SW/IPPD/SS was moved to the CMMI for Development (CMMI-DEV) constellation.
- Two new constellations have been commissioned by CMMI Steering Group:
  - CMMI for Services (CMMI-SVC)
  - CMMI for Acquisition (CMMI-ACQ)
Three Complementary Constellations

CMMI-DEV provides guidance for managing, measuring, and monitoring development processes.

CMMI-SVC provides guidance for delivering services within organizations and to external customers.

CMMI-ACQ provides guidance to enable informed and decisive acquisition leadership.

16 Core Process Areas used in all
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Benefits Information

Information about CMMI benefits is available on the CMMI Performance Results Web site and in the July 2006 SEI technical report, *Performance Results of CMMI-Based Process Improvement (CMU/SEI-2006-TR-004)*.

- This report is based on public reports, interviews, supplementary materials, and comprehensive literature review and is available on the SEI Web site at http://www.sei.cmu.edu/publications/documents/06.reports/06tr004.html.
- The following three slides are adapted from this technical report.
- For more information, see the CMMI Performance Results Web site at http://www.sei.cmu.edu/cmmi/results.html.
Performance Measures - CMMI

The performance results in the following table are from 30 different organizations that achieved percentage change in one or more of the six categories of performance measures below.

<table>
<thead>
<tr>
<th>Performance Category</th>
<th>Median Improvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost</td>
<td>34%</td>
</tr>
<tr>
<td>Schedule</td>
<td>50%</td>
</tr>
<tr>
<td>Productivity</td>
<td>61%</td>
</tr>
<tr>
<td>Quality</td>
<td>48%</td>
</tr>
<tr>
<td>Customer Satisfaction</td>
<td>14%</td>
</tr>
<tr>
<td>Return on Investment</td>
<td>4:1</td>
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</tbody>
</table>
Example Benefit -1

The organization 3HT, with a little over 2 years of CMMI-based process improvement, showed significant improvement in average number of defects found.

Average Number of Defects found in IV&V Before and After Implementation of Quality Control Procedures

- Pre QC: 25 defects
- Post QC: 2 defects

Goal for delivered defects if 100 defects are found in QC
Example Benefit -2

The Software Maintenance Group at Warner Robins Air Logistics Center, a maturity level 5 organization, significantly reduced schedule variance.
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Some of the Organizations Using CMMI

<table>
<thead>
<tr>
<th>Accenture</th>
<th>Bank of America</th>
<th>BMW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boeing</td>
<td>Bosch</td>
<td>Ericsson</td>
</tr>
<tr>
<td>Dyncorp</td>
<td>EDS</td>
<td>Fujitsu</td>
</tr>
<tr>
<td>FAA</td>
<td>Fannie Mae</td>
<td>Hitachi</td>
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<tr>
<td>General Dynamics</td>
<td>General Motors</td>
<td>Infosys</td>
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<tr>
<td>Honeywell</td>
<td>IBM Global Services</td>
<td>KPMG</td>
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<td>Intel</td>
<td>J. P. Morgan</td>
<td>Motorola</td>
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<tr>
<td>L3 Communications</td>
<td>Lockheed Martin</td>
<td>NEC</td>
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<td>NASA</td>
<td>NDIA</td>
<td>NRO</td>
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<td>Nokia</td>
<td>Northrop Grumman</td>
<td>NTT DATA</td>
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<tr>
<td>Polaris</td>
<td>Raytheon</td>
<td>Reuters</td>
</tr>
<tr>
<td>SAIC</td>
<td>Samsung</td>
<td>Social Security Administration</td>
</tr>
<tr>
<td>Tata Consultancy Services</td>
<td>TRW</td>
<td>U.S. Air Force</td>
</tr>
<tr>
<td>U.S. Army</td>
<td>U.S. Navy</td>
<td>U.S. Treasury Department</td>
</tr>
<tr>
<td>Wipro</td>
<td>Zurich Financial Services</td>
<td></td>
</tr>
</tbody>
</table>
CMMI Service Providers (as of 7/31/06)

SEI Partners are licensed by the SEI to provide appraisal services and/or training services.

- There are 226 SEI Partners that offer the Introduction to CMMI training course.
- There are 248 SEI Partners that offer SCAMPI appraisal services.

Instructors and appraisers are authorized by the SEI. There are currently 385 SEI-authorized Introduction to CMMI V1.1 Instructors and 436 SEI-authorized Lead Appraisers.

Since the release of CMMI in 2000, there have been many people trained in CMMI:

- Introduction to CMMI: 54,460
CMMI Appraisals

The following data shows the number of SCAMPI V1.1 Class A appraisals that were conducted since the April 2002 release through June 2006 and reported to the SEI by July 2006:

- 1,581 appraisals
- 1,377 organizations
- 840 participating companies
- 169 reappraised organizations
- 6,001 projects
- 63.8% non-USA organizations
Process Maturity Profile by All Reporting Organizations (as of 6/30/06)

Based on most recent appraisal of 1,377 organizations
Reporting Organizational Categories (as of 6/30/06)

- Commercial/In-house: 67.6%
- Contractor for Military/Government: 28.8%
- Military/Government Agency: 3.6%

Based on 1,377 organizations
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Process improvement should be done to help the business—not for its own sake.

“In God we trust, all others bring data.”  
- W. Edwards Deming
CMMI Can Benefit You

CMMI provides

- guidance for efficient, effective improvement across multiple process disciplines in an organization
- improvements to best practices incorporated from the earlier models
- a common, integrated vision of improvement for all elements of an organization
CMMI Benefits

CMMI-based process improvement benefits include

- improved schedule and budget predictability
- improved cycle time
- increased productivity
- improved quality (as measured by defects)
- increased customer satisfaction
- improved employee morale
- increased return on investment
- decreased cost of quality
For More Information About CMMI

Go to CMMI Web site:

- http://www.sei.cmu.edu/cmmi
- http://seir.sei.cmu.edu

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