Combining TSP and CMMI
Should Mean More
Than Just an Anagram

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Topics

CMMI Adoption: The Good

CMMI Adoption: The Bad

CMMI Practitioners Need TSP

TSP Practitioners Need CMMI

Our Joint Challenge
Topics

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Our Joint Challenge
CMMI Adoption: The Good News

CMMI adoption is:
• having impact
• broad
• increasing

Adoption is NOT limited to:
• DoD contractors (or US Government agencies)
• IT organizations (or embedded software developers)
• Large enterprises
• US (or India)
## CMMI Performance Results

<table>
<thead>
<tr>
<th>Performance Category</th>
<th>Median Imp’vt</th>
<th># Data Points</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost</td>
<td>34 %</td>
<td>29</td>
<td>3 %</td>
<td>87%</td>
</tr>
<tr>
<td>Schedule</td>
<td>50 %</td>
<td>22</td>
<td>2 %</td>
<td>95%</td>
</tr>
<tr>
<td>Productivity</td>
<td>61 %</td>
<td>20</td>
<td>11%</td>
<td>329%</td>
</tr>
<tr>
<td>Quality</td>
<td>48 %</td>
<td>34</td>
<td>2 %</td>
<td>132%</td>
</tr>
<tr>
<td>Customer Satisf’n</td>
<td>14 %</td>
<td>7</td>
<td>-4 %</td>
<td>55%</td>
</tr>
<tr>
<td>Return on Inv’mnt</td>
<td>4.0:1</td>
<td>22</td>
<td>1.7:1</td>
<td>27.7:1</td>
</tr>
</tbody>
</table>

**Note:** The performance results in this table express change over varying periods of time.

These results are taken from the recent report, *Performance Results of CMMI-Based Process Improvement*, that can be found at: [http://www.sei.cmu.edu/publications/documents/06.reports/06tr004.html](http://www.sei.cmu.edu/publications/documents/06.reports/06tr004.html)

Also, see: [http://www.sei.cmu.edu/cmmi/results](http://www.sei.cmu.edu/cmmi/results)
CMMI Adoption: Numbers Trained

Introduction to CMMI course – 55,547 trained as of 8/31/06
- Over 50,000 in the past four and half years alone (vs. eleven years for 19,000 trained in Software CMM)
- Growth has been about 10% every 6 months

Authorized
- Introduction to CMMI V1.1 Instructors – 392
- SCAMPI V1.1 Lead Appraisers – 435
- SCAMPI B&C V1.1 Team Leads – 432
CMMI in Books

The Addison-Wesley SEI Series book at right appears in English, Japanese, Chinese, etc. There are also:

• 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
• Real Process Improvement Using the CMMI
• Systematic Process Improvement Using ISO 9001:2000 and CMMI
• Balancing Agility and Discipline
CMMI in SEI Publications

Technical reports, technical notes, and special reports:

• Initial Draft CMMI for Acquisition (CMMI-ACQ)
• CMMI and Product Line Practices
• CMMI and Earned Value Management
• Interpreting CMMI for Operational Organizations
• Interpreting CMMI for COTS Based Systems
• Interpreting CMMI for Service Organizations
• CMMI and Six Sigma
• Interpreting CMMI for Business Development Org’s (in progress)
Number of SCAMPI V1.1, CMMI V1.1, Class A Appraisals Conducted by Year
Reported as of 31 August 2006

Much of the appraisal data presented in this and later slides is taken from the CMMI Maturity Profile of September 2006:
http://www.sei.cmu.edu/appraisal-program/profile/profile.html
CMMI Website Visits

CMMI web pages hits: 12K/day (and increasing)

Those who visited the CMMI Website during September 2005 two hundred or more times include:

• 29 Defense contractor organizations

• 12 DoD organizations

• 25 Non-DoD government agencies

But also include:

• 49 Universities

• 328 Commercial companies
Who Gets Appraised?\(^1\)

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

Based on 1,377 organizations
Who Gets Appraised?²

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

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Size of the Appraised Organization
Based on the total # of employees within area of the org’n that was appraised

Based on 1,348 organizations reporting size data
Not Only in US and India: Countries where Appraisals have been Reported

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

Red country name: New additions with this reporting
# How Many Appraisals in Which Countries?

17 countries with 10 or more appraisals:

<table>
<thead>
<tr>
<th>Country</th>
<th>Appraisals</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA</td>
<td>598</td>
</tr>
<tr>
<td>India</td>
<td>177</td>
</tr>
<tr>
<td>China</td>
<td>158</td>
</tr>
<tr>
<td>Japan</td>
<td>155</td>
</tr>
<tr>
<td>France</td>
<td>65</td>
</tr>
<tr>
<td>Korea, Rep. of</td>
<td>56</td>
</tr>
<tr>
<td>U.K.</td>
<td>42</td>
</tr>
<tr>
<td>Brazil</td>
<td>39</td>
</tr>
<tr>
<td>Taiwan</td>
<td>31</td>
</tr>
<tr>
<td>Germany</td>
<td>28</td>
</tr>
<tr>
<td>Spain</td>
<td>25</td>
</tr>
<tr>
<td>Australia</td>
<td>23</td>
</tr>
<tr>
<td>Canada</td>
<td>18</td>
</tr>
<tr>
<td>Argentina</td>
<td>15</td>
</tr>
<tr>
<td>Malaysia</td>
<td>15</td>
</tr>
<tr>
<td>Philippines</td>
<td>14</td>
</tr>
<tr>
<td>Egypt</td>
<td>10</td>
</tr>
</tbody>
</table>

And 33 Other countries

**1581** SCAMPI v1.1 Class A appraisals as of July 31, 2006.
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CMMI Practitioners Need TSP

TSP Practitioners Need CMMI

Our Joint Challenge
The Current Situation

The perception among some CMMI users and lead appraisers and team leaders is

• Some aspects of the CMMI models are not uniformly interpreted.
• The SCAMPI\textsuperscript{SM} appraisal method is not always rigorously implemented.
• Some lead appraisers are engaging in unethical business practices.
• Some capability level or maturity level 4 or 5 appraisal results are not justified.
CMMI V1.2

V1.2, released on Aug. 25, 2006, includes several improvements intended to address these problems.
Summary of CMMI Model Changes in V1.2

Many changes were made to the CMMI models to improve quality, including:

• process deployment strengthened in OPF and IPM
• examples added for acquisition and services
• amplifications added for hardware engineering
• work environment material added to OPD and IPM
• overview and glossary improved
• IPPD material simplified and consolidated
• SS addition eliminated; ISM brought into SAM
• SAM is the only “NA-able” process area
• both representations simplified and combined into one document
• name changed to “CMMI for Development”
Summary of SCAMPI Changes in V1.2

Practice characterization and rating rules were clarified.

Organizational unit sampling requirements for organizational sampling were strengthened.

The Appraisal Disclosure Statement (ADS) now requires:
- Organizational sampling criteria and decisions (e.g., projects included, excluded; percentage of organization represented)
- Basis for maturity/capability level 4 and 5 appraisal results

V1.2 appraisal results are valid for a maximum of 3 years from the date of the ADS.
A More Rigorous Transition to SCAMPI V1.2

The following actions are being implemented:

• The SEI continues to investigate all potential incidents of abuse of the SCAMPI appraisal method or Code of Professional Conduct and is taking appropriate action.

• Appraisal sponsors will be required to sign Appraisal Disclosure Statements authorizing the SEI to perform any required audits of appraisal results.

• All authorized and candidate lead appraisers (LAs) must complete a proctored exam and attend a Face-to-Face Workshop held by the SEI Appraisal Program.

• For level 4 or 5 appraisals, the LA must also be certified, which includes completion of an oral exam.
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Our Joint Challenge
Some Flawed Approaches to CMMI¹

CMMI implementations are sometimes bureaucratic, heavy-weight, poor-quality implementations.
- Satisfy criteria in model, but aren’t effective and efficient

Some do it for the maturity level number, so may not be getting the real benefits of PI
- Though visible to high levels of organizational management, PI doesn’t impact the real work, just the infrastructure
- The “how-to” is seen as EPGs, MSGs, PATs, TWGs, …

TSP/PSP can help address this.
Some Flawed Approaches to CMMI\textsuperscript{2}

Some organizations are not institutionalizing their improvements
  • Capability erodes after the appraisal
  • Future projects don’t use the standard process
    - Want to be more “creative”?  
    - Want to “cut corners”?  
    - Customer doesn’t see the benefit?

In some organizations it takes too long
  • Though sold as long term improvement, ROI is too slow to come

**TSP/PSP can help address this.**
Some Flawed Approaches to CMMI Levels 4-5

Implement Levels 4-5 like this?

- For statisticians only
- Applied retrospectively and at an aggregate level
- Processes defined centrally; deployed inconsistently
- Few improvement suggestions
- Data-sparse environment
- “Statistical management” of a few subprocesses

Or like this?

- For all practitioners
- Applied day-to-day as part of one’s job
- Processes deployed and aligned at all levels
- Effective review of many improvement suggestions
- Data-rich environment
- “Statistical management” in every life cycle phase, by all teams, and often of more than one attribute

TSP is among the best implementations of CMMI that we have seen.
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Our Joint Challenge
TSP and PSP Not Sufficient

As Jim McHale and Dan Wall reported in “Mapping TSP to CMMI,” while PSP/TSP cover the engineering and project management process areas generally well, they do not adequately cover all process management and support process areas of CMMI.

CMMI and People CMM define the organizational management and support infrastructure needed to nurture, align, and sustain the appropriate use of the TSP and PSP.
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Our Joint Challenge
TSP and CMMI: Why Not Both?¹

Both TSP and CMMI have a large and growing community of practitioners.

For both, user experiences and benefits have been documented in dozens (if not hundreds) of presentations and publications.

Both are from the same source – the SEI – and both originated, largely or in part, with Watts Humphrey.

Each includes concepts and tools not available in the other.

But few organizations are encouraging or using both.
To compete successfully today, companies must rapidly mature innovations, uphold the highest standards of quality and service, and operate as “employers of choice.”

Need to know more than management consultants or books can tell them; need to deeply understand their business.

CMMI is a “proven” collection of responsible practices* - a minimum set needed to run a business, but organizations today also need to establish a culture capable of learning and empowerment – the culture of TSP/PSP.

CMMI and TSP, together, can help achieve these things.

*A term of Jim Moore.
SEI Strategy: Link CMMI and TSP

Our new focus is to assist organizations, projects, teams and individuals in conquering the “how to” of Process Improvement, and gaining the best business results from doing so, by:

• Characterizing superior organizational performance
• Increasing their transition and adoption of superior operational practices
• Increasing the quality and usefulness of high maturity appraisals
• Providing an integrated measurement framework
• Providing a CMMI “how to” course based on TSP
• Executing a process research agenda for the future
SEI’s Strategic Process and Measurement Framework Overview

- **What?**
  - Demands by the customers, management, users, or acquirers

- **Why?**
  - Model processes
  - Appraisal methods
  - Measurement
  - Improvement strategy and plan

- **How?**
  - Operational processes
  - Professional methods
  - Measurement
  - Process Support Tools
Summary

CMMI and TSP have proven their value and attained worldwide recognition; yet few organizations adopt both.

CMMI interpretation, implementation, and appraisal are sometimes problematic. V1.2 includes changes to address these problems.

But many CMMI users cannot establish an environment that supports learning and empowerment without TSP/PSP.

TSP/PSP users need an environment that nurtures, aligns, and sustains the best operational practices and professional methods, and thus need CMMI (and People CMM).

Therefore, the longer-term solution lies in encouraging the broader adoption of both CMMI and TSP/PSP.
For More Information

James McHale and Daniel S. Wall, “Mapping TSP to CMMI,” at:
http://www.sei.cmu.edu/publications/documents/04.reports/04tr014.html

More information about CMMI can be found at:
http://www.sei.cmu.edu/cmmi/

More information about TSP and PSP can be found at:
http://www.sei.cmu.edu/tsp/