Applying the CMMI to the Process Improvement Project

Pat O’Toole, PACT
www.PACTCMMI.com
May, 2014
or

“Eating Your Own Dog Food”

Pat O’Toole, PACT

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Motivation

• “The EPG should perform one maturity level higher than the group it’s trying to influence”
  – Aligns exhibited behavior with desired behavior
  – Establishes credibility

• However, many EPGs are sending the message:
  “Do as I say, not as I do”

• This presentation shows how the CMMI can be adopted by the EPG itself to change this message to:
  “Do as I say, just as I do.”
Acknowledgments

Terms like these are often used in the following material:

CMMI® Framework

IDEALSM Model

Capability Maturity Model IntegrationSM and IDEALSM are service marks of Carnegie Mellon University

Although CMMI® is registered in the U.S. Patent & Trademark Office, in this context it means:

“Canine Morsels for Meta-Improvement.”
Exercise #1: What’s the Acronym?

- Special Thanks for the Use of the Following Terms:
  - Accelerated Leveraging of Process Opportunities
  - Processes Utilizing Reliable, Intuitive, and Natural Approaches
  - Keep Improving By Borrowing & Leveraging Everyone’s Stuff & By Improving Technology Strategically
Your Menu this Morning Includes…

- Hors d’oeuvres
- Main course
- Dessert
Hors D’oeuvres

• OPF served with a selection of savory seasonings:
  – Establish an Organizational Policy
  – Plan the Process
  – Adequate Resources
  – Assign Responsibility
  – Train People
  – Manage Configurations
  – Involve Relevant Stakeholders
  – Monitor & Control the Process
  – Objectively Evaluate Adherence
  – Review Status with Higher Level Management
  – Establish a Defined Process
  – Collect Improvement Information.
OPF Specific Practices

• Key Practices (Nuggets vs. Filler)
  – SP1.1 Establish Organizational Process Needs
    • What do you want to be when you grow up?
    • What are you REALLY trying to achieve?
  – SP1.3 Identify the Organization’s Process Improvements
    • What do you need to do to achieve it?
  – SP3.1 Deploy Organizational Process Assets
    • What is being provided to enable achievement?
  – SP3.4 Incorporate Process-Related Experiences into the Organizational Process Assets
    • How do you know it’s better, and how do you make it betterer?
OPF Generic Practices

• Key Generic Practices
  – GP2.2 Plan the Process
    • Process Improvement Plan
  – GP2.4 Assign Responsibility
    • MSG = Project Sponsor
    • EPG = Project Team
    • PAT = Subject Matter Experts
  – GP2.5 Train People
    • CMMI and appraisal methods
  – GP2.8 Monitor and Control the Process
    • “Treat” it like a project
  – GP3.2 Collect Improvement Information
    • Exemplary work products
    • Measures, measurement results
    • Lessons learned / improvement suggestions.
Cleansing the Pallet

• OPF is the CMMI’s foundation for ongoing improvement
  – And the generic practices spice it up a bit
  – But, like hors d’oeuvres, it merely whets the appetite for that which is yet to come…
And Now It’s Time for the …

- Hors d’oeuvres
- Main course
- Dessert
Tonight’s Main Course Consists of…

… Alphabet Soup!

WP
PO
OT

… Alphabet Soup!

SD

M
A
DAR

RSK

WMC

SEPG Conference, May 2014
# Macro-Level WP and WMC

## Maturity Level 2

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<th>1/1/14 Mini Appraisal</th>
<th>1Q14 Plan</th>
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- REQM: 2
- SAM: 2
- WMC: 2
- WP: 2

Svc Establish & Delivery:
- SD: 2

Support:
- CM: 2
- MA: 2
- PPQA: 2
# Macro-Level WP and WMC

## Maturity Level 3

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Exercise #2 (1 of 3)

• The next slide lists the ML2 and ML3 process areas for both the CMMI-SVC and CMMI-DEV

• For your organization, classify the process areas based on pain/gain by placing them into one of three buckets:
  – Priority 1
  – Priority 2
  – Priority 3.
Exercise #2 (2 of 3)

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Exercise #2 (3 of 3)

• Balance the priority buckets so there is approximately an equal number in each

• Rank the Priority 1 bucket into:
  – Priority 1-A
  – Priority 1-B
  – ...
  – Priority 1-F.
Changing Perspective…

Macro View

Micro View
Changing Perspective…

Macro View

Micro View

Specific Goal and Practice Summary

SG 1 Establish Baselines
SP 1.1 Identify Configuration Items
SP 1.2 Establish a Configuration Management System
SP 1.3 Create or Release Baselines
SG 2 Track and Control Changes
SP 2.1 Track Change Requests
SP 2.2 Control Configuration Items
SG 3 Establish Integrity
SP 3.1 Establish Configuration Management Records
SP 3.2 Perform Configuration Audits
Exercise 3 (1 of 3)

• Establish estimates of work products and task attributes
  – “Size” estimation practice

• Exercise #3a
  – Imagine that you are all lead appraisers
  – You just received an email from a potential client that reads:
    “We would like you to conduct our upcoming CMMI appraisal. How much will it cost?”
  – Work with the folks around you to formulate the questions you’d need answered to generate a reasonable cost estimate
  – To simulate reality, you have 4 minutes to respond…
    • Quit looking up here, you only have 3 minutes and 50 seconds left!
    • 3 minutes…
    • 2 minutes…
    • 1 minute…
Exercise #3 (2 of 3)

- Questions to be asked:
  - Which constellation – DEV, SVC, or ACQ?
  - What type of appraisal – Class A, B, or C?
  - If Class B or C, must we use the SCAMPI B or SCAMPI C?
  - What’s the target maturity level or capability level profile?
  - Which services or engineering disciplines are in scope?
  - How many people and projects are in the organizational unit?
    - How many will we need to include to get a representative sample?
  - Is SAM in or out of scope?
  - How many geographical locations?
  - Will the appraisal be conducted in English?
  - Has the organization been appraised previously?
    - What ML / CL profile was achieved?
  - How many people from the organization will serve as ATMs?
  - Should the bid include an “Intro to CMMI” course?
  - Others???
Exercise #3 (3 of 3)

• Exercise #3b:
  – Now think about your improvement project
    • What are the “size attributes” you should consider to estimate
      – Effort / Budget
      – Schedule – from 2 perspectives
        • Performance improvement
        • When can the next appraisal be schedule?
  – Think about things like:
  – You’ve got 2 minutes to jot yourself a few notes…
Exercise #3 (4 of 3)

- Did you consider things like:
  - How many:
    - Gaps to the target level (and how many are H/M/L complexity)?
    - Services or engineering disciplines are you trying to influence?
    - Service systems or life cycles need to be considered?
    - Hours/week will be invested in improvement projects?
  - What is your current level of “improvement productivity?”
  - On a 1-5 scale, how strong is the support / resistance from:
    - Management?
    - Service providers / engineers / thought leaders?
    - Customers?
  - Are there other change activities currently underway?
    - Re-organizations or mergers
    - ISO9000 / ITIL
    - Empowerment Initiative for Enabling Improvement in Organizations
      - Exercise #1 (cont’d):
        - EIEIO initiative.
Define Lifecycle Phases

**Initiating**
- Set context
- Build sponsorship
- Establish improvement infrastructure
- Characterize current and desired states
- Develop recommend actions
- Set priorities

**Learning**
- Analyze and validate
- Propose future actions
- Implement solution
- Refine solution
- Pilot/test solution
- Create solution

**Acting**
- Plan actions
- Develop approach
- Set priorities
- Develop recommendation actions
- Create solution

**Diagnosing**
- Analyze and validate
- Propose future actions
- Implement solution
- Refine solution
- Pilot/test solution
- Create solution

**Establishing**
- Plan actions
- Develop approach
- Set priorities
- Develop recommendation actions
- Create solution
- Stimulus for change
Define Lifecycle Phases

- **January**
  - PM: Size est. template, Use case template, Test case template
  - Dev: Effort est. template, Use case training, Test case metrics
  - Test: Cost est. template, Use case metrics, Test tool evaluation

- **February**
  - PM: Size est. template, Use case template, Test case template
  - Dev: Effort est. template, Use case training, Test case metrics
  - Test: Cost est. template, Use case metrics, Test tool evaluation

- **March**
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  - Dev: Effort est. template, Use case training, Test case metrics
  - Test: Cost est. template, Use case metrics, Test tool evaluation

- **April**
  - PM: Size est. template, Use case template, Test case template
  - Dev: Effort est. template, Use case training, Test case metrics
  - Test: Cost est. template, Use case metrics, Test tool evaluation

- **May**
  - PM: Size est. template, Use case template, Test case template
  - Dev: Effort est. template, Use case training, Test case metrics
  - Test: Cost est. template, Use case metrics, Test tool evaluation

**Build**
- Size est. template
- Use case template
- Test case template

**PM**
- Effort est. template
- Use case training
- Test case metrics

**Dev**
- Cost est. template
- Use case metrics
- Test tool evaluation

**Test**
- WBS template
- JAVA Standards
- C++ Standards
- Test tool evaluation

**Pilot**
- Size est. template
- Use case template
- Test case template

**Guideline**
- Effort est. template
- Use case training
- Test case metrics

**Standard**
- Size est. template
- Use case template
- Test case template
Service System Development

• Key Practices
  – SP1.1 Develop Stakeholder Requirements
    • Management is the customer
    • Project teams are the users
    • Other relevant stakeholders
      – EIEIO Initiative
  – SP1.3 Analyze and Validate Requirements
    • Perform peer reviews on new process stuff
    • Pilot, pilot, pilot
    • Remember – it’s all about the stakeholders
      – The more paw prints you can get on your process droppings the less resistance you will encounter!
Measurement and Analysis

• Macro Level: Determine Process Improvement’s ROI
  – You are competing for corporate funds just like everyone else
  – Why should management continue investing in YOUR program?

• Micro Level: Hypothesize the value of each improvement
  – Design changes to maximize results
  – Implement changes to achieve results
  – Measure the actual results
  – Keep management informed
    • Or, better yet, keep them actively engaged!
Organizational Training

• It's more than the “Intro to CMMI”
  – Organizational Change Management
  – Presentation skills
  – Negotiation skills
  – Written/verbal communication skills
  – Process/procedure standards

• Convey the skills and knowledge necessary to perform the improved process or to use the new tool
  – Subject Matter Experts provide the content
  – Instructional Designers package content to maximize learning
  – EPG provides a safe setting for practice & initial implementation
  – Provide ongoing coaching and mentoring
  – Solicit feedback – and then act on it!
## Risk Management – Project Factors

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<td><strong>Organization Stability</strong></td>
<td>Little or no change in management or structure</td>
<td>Some management change or reorganization expected</td>
<td>Management or organization structure is continually or rapidly changing</td>
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<td><strong>Organization Roles and Responsibilities</strong></td>
<td>Individuals throughout the organization understand their own roles and responsibilities and those of others</td>
<td>Individuals understand their own roles and responsibilities, but are unsure who is responsible for work outside their immediate group</td>
<td>Many in the organization are unsure or unaware of who is responsible for many of the activities of the organization</td>
</tr>
<tr>
<td>4.3</td>
<td><strong>Policies and Standards</strong></td>
<td>Development policies and standards are defined and carefully followed</td>
<td>Development policies and standards are in place, but are weak or not carefully followed</td>
<td>No policies or standards, or they are ill-defined and unused</td>
</tr>
<tr>
<td>4.4</td>
<td><strong>Management Support</strong></td>
<td>Strongly committed to success of project</td>
<td>Some commitment, not total</td>
<td>Little or no support</td>
</tr>
<tr>
<td>4.5</td>
<td><strong>Executive Involvement</strong></td>
<td>Visible and strong support</td>
<td>Occasional support, provides help on issues when asked</td>
<td>No visible support; no help on unresolved issues</td>
</tr>
<tr>
<td>4.6</td>
<td><strong>Project Objectives</strong></td>
<td>Verifiable project objectives, reasonable</td>
<td>Some project objectives, measures may be</td>
<td>No established project objectives or objectives are not measurable</td>
</tr>
<tr>
<td></td>
<td></td>
<td>requirements</td>
<td>questionable</td>
<td></td>
</tr>
<tr>
<td>5.0</td>
<td><strong>Customer/User Factors</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.1</td>
<td><strong>User Involvement</strong></td>
<td>Users highly involved with project team, provide significant input</td>
<td>Users play minor roles, moderate impact on system</td>
<td>Minimal or no user involvement; little user input</td>
</tr>
<tr>
<td>5.2</td>
<td><strong>User Experience</strong></td>
<td>Users highly experienced in similar projects; have specific ideas of how needs can be met</td>
<td>Users have experience with similar projects and have needs in mind</td>
<td>Users have no previous experience with similar projects; unsure of how needs can be met</td>
</tr>
</tbody>
</table>
# Risk Management – EPG Factors

<table>
<thead>
<tr>
<th>Risk Factor #</th>
<th>Risk Factors</th>
<th>Low Risk Cues</th>
<th>Medium Risk Cues</th>
<th>High Risk Cues</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.1</td>
<td>Attitude Toward Change</td>
<td>A variety of changes have been introduced, with recent success</td>
<td>The organization has tried to change with varied success; people are hesitant to try new approaches</td>
<td>The organization has been severely burned by one or more changes; there is widespread fear of new approaches</td>
</tr>
<tr>
<td>4.2</td>
<td>Experience with Quality Programs</td>
<td>The organization has successfully implemented a major quality program with favorable results</td>
<td>One or more quality programs have been attempted with limited success; some members of the organization are skeptical, others think the programs a waste of time</td>
<td>One or more quality programs have been attempted; the organization believes the efforts were wastes of time; active opposition is expected to &quot;yet another&quot; quality or process improvement initiative</td>
</tr>
<tr>
<td>4.3</td>
<td>Action Orientation</td>
<td>The organization is oriented to taking action and solving problems; members of the organization have proven ability to make fundamental changes</td>
<td>Some members of the organization take action, but there are political struggles to get broad changes made</td>
<td>The organization hides behind corporate politics or insists on long reviews and discussions prior to taking action</td>
</tr>
<tr>
<td>4.4</td>
<td>Use of Facts</td>
<td>The organization has defined business goals; the organization collects and uses measures regularly</td>
<td>The organization has some limited experience with measurement; parts of the organization are quality- and fact-oriented</td>
<td>Most decisions in the organization are based on politics; there are no measurable business or improvement goals in place</td>
</tr>
<tr>
<td>4.5</td>
<td>Patience with Change</td>
<td>Management and key leaders in the organization are willing to spend time socializing the changes</td>
<td>Some managers or key technical leaders are impatient and push for quick results</td>
<td>There is little experience with SPI; one or more leaders in key positions push for quick results</td>
</tr>
</tbody>
</table>
So Much To Do, So Little Time…

• **Management wants:**
  – Six Sigma
  – Lean
  – ITIL
  – EIEIO

• **Projects want:**
  – Data Drill
  – Doors
  – MiniTab

• The Class C appraisal identified 15 weaknesses

• You’ve got a backlog of 30+ improvement requests

• Projects are screaming there is too much administrivia

• So, what should you do next???
Decision Analysis and Resolution

Candidate Improvements

1. Six Sigma
2. Lean
3. ITIL
4. Data Drill
5. Doors
6. MiniTab
7. Weakness #1
8. Weakness #N
9. Improvement #1
Decision Analysis and Resolution

**Criteria**

1. Hypothesized benefit
2. Cost to develop / implement
3. Number of people affected
4. Time to achieve benefits
5. CMMI level related to change
6. Acceptability to management
7. Acceptability to project teams.
Decision Analysis and Resolution

- Rate the criteria for each candidate

<table>
<thead>
<tr>
<th></th>
<th>Benefit</th>
<th>Cost</th>
<th># People Affected</th>
<th>Time to Achieve</th>
<th>ML</th>
<th>Mgt</th>
<th>Project Teams</th>
<th>SCORE</th>
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<tbody>
<tr>
<td>Data Drill</td>
<td>10</td>
<td>8</td>
<td>5</td>
<td>8</td>
<td>8</td>
<td>6</td>
<td>8</td>
<td>53</td>
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<tr>
<td>Doors</td>
<td>6</td>
<td>5</td>
<td>8</td>
<td>8</td>
<td>6</td>
<td>6</td>
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<td>ITIL</td>
<td>3</td>
<td>5</td>
<td>3</td>
<td>7</td>
<td>7</td>
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<td>Lean</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>7</td>
<td>3</td>
<td>7</td>
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<tr>
<td>MiniTab</td>
<td>4</td>
<td>1</td>
<td>9</td>
<td>7</td>
<td>9</td>
<td>4</td>
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<tr>
<td>Six Sigma</td>
<td>10</td>
<td>10</td>
<td>9</td>
<td>6</td>
<td>4</td>
<td>7</td>
<td>8</td>
<td>54</td>
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<tr>
<td>Improvement #1</td>
<td>2</td>
<td>4</td>
<td>5</td>
<td>2</td>
<td>9</td>
<td>8</td>
<td>10</td>
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<tr>
<td>Improvement #2</td>
<td>1</td>
<td>6</td>
<td>5</td>
<td>7</td>
<td>3</td>
<td>2</td>
<td>6</td>
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<tr>
<td>Improvement #3</td>
<td>7</td>
<td>2</td>
<td>5</td>
<td>8</td>
<td>7</td>
<td>7</td>
<td>4</td>
<td>40</td>
</tr>
<tr>
<td>Improvement #N</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>6</td>
<td>3</td>
<td>6</td>
<td>1</td>
<td>22</td>
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<tr>
<td>Weakness #1</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>4</td>
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<tr>
<td>Weakness #N</td>
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<td>8</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>6</td>
<td>5</td>
<td>32</td>
</tr>
</tbody>
</table>

- Sort by Score and work on Top N first
Exercise #4 (1 of 2)

• Working independently or in self-selected teams, explore the following questions:
  – What criteria would YOU use to select the next 4-5 improvement initiatives from your list of 40 candidate improvements?
  – Rank the criteria in order of importance with respect to project success.
Exercise #4 (2 of 2)

• Now go back to your process area prioritization from Exercise #2
  – Spend a minute reflecting on the following question:

    Do the process areas you prioritized in Exercise #2 square with the DAR criteria you identified in Exercise #4?

  – If not:
    • Do you need to re-prioritize process areas in light of the criteria, OR
    • Do you need to add a criteria or two?
Cleansing the Pallet

- The EPG should interpret the CMMI process areas so they apply to the improvement project
  - “Do as I say just as I do!”
And Now It’s Time for …

- Hors d’oeuvres
- Main course
- Dessert
Hopefully You’ve Saved Some Room!

• For dessert… the other CMMI constellations
  – The EPG develops/acquires process assets for the organization
  – The CMMI-DEV and -ACQ provide additional “food for thought.”
CMMI for Development / Acquisition

• Unique DEV-related Process Areas
  – Requirements Development
  – Technical Solution
  – Product Integration
  – Verification
  – Validation

• Unique ACQ-related Process Areas
  – Agreement Management
  – Acquisition Requirements Development
  – Acquisition Technical Management
  – Acquisition Verification
  – Acquisition Validation
  – Solicitation and Supplier Agreement Development.
Conclusion

• When “eating their own dog food,” too many process improvement groups fill up on tasty hors d’oeuvres
  – They mistakenly believe that OPF is their whole meal
  – They gobble up only that portion of the model
  – And then produce a big pile of OPD!
Questions?

Pat O’Toole

pact.otoole@att.net
www.PACTCMMI.com