Experiences with Indicator-Based CMMI Appraisals at Raytheon

Use and benefits/drawbacks of identifying PIIs in preparing and conducting appraisals

Presented to National Defense Industrial Association
2nd Annual CMMI Technology Conference and User Group
Denver, Colorado

November 11-14, 2002

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Preparation for Appraisals

Each project, in maintaining its processes and preparing for an appraisal

- Projects use Practice Implementation Indicators (PIIs)
  - Identify each item of documentation as direct or indirect
  - Require projects to understand and consider their level of compliance with CMMI practices
  - Serve as a basis for understanding what CMMI really means
  - Ensure adequacy of appraisal preparation

- “PA mapping tool” provides mechanism for identifying CMMI compliance
  - Used in preparation for appraisals, by projects and the organization
  - Internally developed, Access-based (sometimes adapted for web-based use)

- Workshops provide understanding
  - Define self-assessment and preparation process
  - Provide added insights into intent and content of model and individual practices
  - Review gap analysis between CMMI and current practices
  - Mechanism for organization’s process group to assist projects
Conduct of Appraisals

**Each appraisal team**
- Uses Practice Implementation Indicators (PIIs)
  -- Data provided by organization/projects in PA mapping tool, indicates their CMMI compliance
  -- Team identifies ‘real’ PII for each practice in conducting the appraisal, based on SCAMPI definition: direct, indirect, affirmations
- Appraisal team’s process identifies practice and goal implementation
  -- Team uses team tool and summary method
  -- For each practice, across entire organization, team identifies PII (i.e., fully implemented, largely implemented, partially implemented, or not implemented), and PII information helps identify goal satisfaction
  -- In appraisals, differences between appraisal team evaluation and organization’s self-evaluation are used to provide lessons learned feedback
CMMI-Based Appraisals
Used at Raytheon

(1) Verification Approach
- Class C appraisal
- Limited scope, on per-project basis
- Provides feedback to assist internal improvements
- Typically used by organizational process group for individual projects
- Uses either PA mapping workshops or ICPA

Benefits:
- Project status review and feedback
- PA workshops emphasize identifying Plls, collecting direct/indirect artifacts and mentoring

(2) CMMI Focus Review
- Class B appraisal, in-depth
- Limited scope, typically per-project basis
- Provides strengths and weaknesses, but no rating
- Typically used for initial appraisals in organization
- Provides lessons learned for preparation for future

Pll for each practice

Benefits:
- Organization/project gets feedback
- Emphasizes direct/indirect
CMMI-Based Appraisals Used at Raytheon

(3) CMMI “PBA” Process Baseline Appraisal
   - Class B appraisal
   - In-depth, thorough appraisal, may limit scope
   - Provides strengths and weaknesses, but no rating
   - Typically used for intermediate appraisals in organization

   PII for each practice
   Benefits:
   -- Organization & projects indicate their level of CMMI compliance
   -- Org/project understanding

(4) Standard CMMI Appraisal Method for Process Improvement (SCAMPI)
   - Class A appraisal
   - Most in-depth, thorough appraisal, with broad coverage
   - Provides a rating (e.g., CMMI maturity level 1 through 5)

   PII for each practice
   Benefits:
   -- Completeness, understanding
Appraisal Cycle
*Approach that facilitates evolving improvements*

**Project leader**
- Develops PA mapping
- Works closely with project personnel
- Identifies gaps
- Takes actions to fill gaps

**Project Self-Appraisal**

**Verification & Mentoring**

**CMMI Focus Review**
- Reviews PA mapping and actual practices (Class C)
- Works closely with project leader
- Provides guidance and recommendations

**Process group**
- Early Appraisal (Class B)
  - May focus on individual project
  - Provides in-depth feedback and recommendations to project and org
  - Org and project(s) take actions to address weaknesses and recommendations

**Intermediate Appraisal (Class B)**
- Focuses on 2-4 projects
- Provides in-depth feedback and recommendations to projects and org
- Org and projects define and take actions to address weaknesses and recommendations

**SCAMPI (Class A)**
- Focuses on multiple projects
- Provides rating and in-depth feedback / recommendations to projects and org
- Org and projects define and take actions to address weaknesses and recommendations

**SCAMPI**

**CMMI PBA**
Benefits and Drawbacks

**Benefits**

- **Use of PIIs in preparation**
  - Assists organizations and projects in understanding their level of compliance
  - Provides added knowledge of CMMI that helps interviewees understand appraisal team questions
  - Builds database for individual projects, that can be updated and maintained (helps evolve model knowledge and appraisal preparations)

- **Use of PIIs in appraisal**
  - Assists team in evidence review and correlating affirmations
  - Provides insights, based on similarities or differences in organization’s self-evaluation versus appraisal team evaluation
  - Can provide lessons learned to organization, helps future understanding and improvements
  - For mature organizations, saves appraisal time

**Drawbacks**

- **Use of PIIs in preparation**
  - Takes added time and effort for organizations and projects to prepare
Significant Lessons

Preparing for a CMMI appraisal

- Major preparation effort for organization and projects
  -- Must collect, organize, and review the evidence
  -- Provides needed understanding

- Significant preparation and effort for appraisal team

Evolving through multiple phased appraisals

- Early use of PIIs and mentoring with Class C method helps provide useful project insights

- Participation in Class B appraisals essential before Class A SCAMPI

Most important – must retain focus on value of the improvements, not just the evidence or achieving success in assessments