Implementing Process Improvement Using CMMI
An Acquirer’s Perspective
November 14, 2002
Outline

• Premise for the presentation
• What is CITPO?
• CITPO’s process improvement approach
• What’s missing in the CMMI framework
• CITPO's Lessons learned
• Challenges
Presentation Premise

• The CMMI framework can be implemented in a DoD acquisition organization

• The CMMI framework is not all inclusive
  – No one framework exits, other models and sources need to be used
Assistant Secretary of Defense

Health Affairs

Management Activity

Military Health Services (MHS)

Program Executive Office (PEO)

Program Management Offices

- DMLSS
- EI / DS
- RITPO
- TIMPO
- TMIP
CITPO Projects
Not Again!

- Total Quality Leadership
- Change Management
- Quality Improvement
- ISO 9000
- Business Process Re-engineering
- Organizational Development
CITPO’s Process Improvement Approach

- **Initiate**
- **Diagnose**
- **Establish**
- **Act**
- **Learn**

Apply at each Level:

1. **Initiate Process Improvement**
2. **Conduct Process Assessment**
3. **Analyze Results & Derive Action Plan**
4. **Confirm Improvements**
5. **Document, Implement, & Revise**
6. **Monitor Performance & Sustain Improvement Gains**
7. **Examine CITPO’s Needs**

Each step is connected to the next, illustrating the iterative nature of the process improvement approach.
CITPO Process Improvement Organization

**Process Improvement Steering Group**
- Provides Guidance and Resources
- Appoints PA Owners and PAIT Leads
- Approves Procedure Definitions
- Charters PIT
- Provides Guidance and Resources
- Monitors Results

**Process Improvement Team (PIT)**
- Plans Program
- Reports Status
- Provides Training
- Develops Action Plan(s)
- Advises PAIT(s)
- Produces Process Area Descriptions
- Provides Quality Assurance Function
- Measures Improvement Effectiveness
- Audits Processes / Procedures
- Evaluates Work Products
- Trains PAITs
- Facilitates Process Development

**Process Area Improvement Team (PAIT)**
- Develops Process Area
- Produces Procedure Definitions
- Develops Implementation Plan
- Briefs Implementation Plan

**Implementers**
- Implement Approved Procedures
- Produce Work Products
- Participate in Assessments
- Suggest Improvements
Which Model to Choose?

<table>
<thead>
<tr>
<th>FAA-iCMM</th>
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<tbody>
<tr>
<td>(version 1.0)</td>
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<table>
<thead>
<tr>
<th>Configuration Management</th>
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<tbody>
<tr>
<td>Contract Management</td>
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<tr>
<td>Outsourcing</td>
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<tr>
<td>Project Management</td>
</tr>
<tr>
<td>Quality Assurance &amp; Management</td>
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<tr>
<td>Requirements</td>
</tr>
<tr>
<td>System Test &amp; Evaluation</td>
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<tr>
<td>Transition</td>
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</tbody>
</table>

Level 2
Why CHCS II?

• ACAT I program
• Will subsume the legacy AIS functionality
• Largest CITPO development project
  – Dollars
  – Resources
• Several projects being closed out
Measurement in CITPO

<table>
<thead>
<tr>
<th>Stakeholders</th>
<th>CITPO</th>
<th>Contractors</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Processes &amp; Procedures</td>
<td>Development</td>
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<td></td>
<td>Work Products</td>
<td>Support</td>
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<td>Processes &amp; Procedures</td>
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<td>Work Products</td>
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<td>Work Products</td>
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<tr>
<td></td>
<td>Contract Performance</td>
<td></td>
</tr>
</tbody>
</table>
Acquirer - Developer Maturity Matching

**Mismatch**
- Mature acquirer must mentor low maturity developer
- Schedule & product quality at risk
  
  **Outcome not predictable**

**Matched Team**
- Match of skills & maturity
- Team approach to risk
- Execution to the plan
- Measurable performance
- Quantitative management
  
  **Highest probability of success**

**Matched, but…**
- Constant crises
- No requirements or risk management
- No discipline
- No repeatable processes or procedures
  
  **Chaos reigns**

**Mismatch**
- “Acquirer is always right” hurts relationship
- Acquirer encourages shortcuts
  
  **Outcome not predictable**

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Adapted from SEI’s “Process and Maturity Model Fundamentals” presentation
## Stakeholder Interfaces

<table>
<thead>
<tr>
<th>Process Area</th>
<th>Developer &amp; Acquirer Interface</th>
<th>Acquirer Processes</th>
<th>Acquirer &amp; External Stakeholder Interfaces</th>
</tr>
</thead>
<tbody>
<tr>
<td>Configuration Management</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Integrated Supplier Management</td>
<td>X</td>
<td>X</td>
<td>--</td>
</tr>
<tr>
<td>Process &amp; Product Quality Assurance</td>
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<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Project Monitoring &amp; Control</td>
<td>X</td>
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</tr>
<tr>
<td>Project Planning</td>
<td>X</td>
<td>X</td>
<td>--</td>
</tr>
<tr>
<td>Measurement &amp; Analysis</td>
<td>--</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Requirements Development</td>
<td>X</td>
<td>X</td>
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<tr>
<td>Requirements Management</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Risk Management</td>
<td>--</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Supplier Agreement Management</td>
<td>X</td>
<td>X</td>
<td>--</td>
</tr>
</tbody>
</table>

**Legend:**
- **X** indicates a stakeholder interface.
- **--** indicates no stakeholder interface.

**Notes:**
- Acquirer Processes:
  - **Project Level**
  - **Program Level**
- Acquirer & External Stakeholder Interfaces:
  - **Acquirer Processes**
  - **Program Level**
Missing Elements in a DoD Environment

• Program-level processes
  – Financial management and budgeting
  – Project initiation

• Project-level processes
  – Project execution
  – Project closeout

• Other support processes
  – Personnel / Administration management
  – Systems security
CITPO's Lessons Learned

• Limited resources available
  – Planning and management resources taken out of hide
  – Procedure development loses the competition to “real work”
  – Process improvement professionals are a limited commodity
  – “Free” resources are available for a reason

• Infrastructure takes time to design, develop, and implement
  – A level 3 concern but planning for now saves rework

• Need focused individual involvement
  – Not everyone needs to work a process area at the same time
  – Use small groups within a Process Action Team for specific tasking

• Initial Assessment can identify “non-Process Area” shortfalls
  – Additional resources required to take on or schedule adjustments necessary

• “Nine one-month pregnant women do not produce a baby”
Challenges

• Interfacing with the enterprise-level process improvement program
• Using Dynamic Object-Oriented Requirements System (DOORS) to produce our documentation
• Establishing an interactive repository
  – Process diagrams (Visio)
  – Procedure workflows (Visio)
  – Activity tables (MS Word)
  – Roles and responsibilities roll-up (SQL database)
Interactive Repository

Process and Product Quality Assurance (PPQA)

- Collect Data Measures (MA-PROC-nn)
- Prepare CITPO PPQA Plan (PPQA-PROC-01)
- Perform Process Audit (PPQA-PROC-02)
- Perform Work Product Evaluation (PPQA-PROC-03)
- Collect Data Measures (MA-PROC-nn)
- Projects' Project Plan (xxxx-PP-PROC-nn)
- Document Version Control (CM-PROC-nn)
- Strategic Plan (aaa-PROC-nn)
- Integrated Master Schedule (aaa-PROC-nn)
- CITPO PPQA Schedule
- CITPO PPQA Plan
- CITPO Process Audit Report
- CITPO Work Product Evaluation Report
- Process Asset Library
Interactive Repository

**Prepare CITPO PPQA Plan (PPQA-PROC-01)**

1. **Develop Draft PPQA Plan**
   - Strategic Plan (aaa-PROC-nn)
   - Integrated Master Schedule (aaa-PROC-nn)

2. **Coordinate Schedule**
   - Draft CITPO PPQA Plan
   - CITPO PPQA Schedule

3. **Write Plan**
   - CITPO PPQA Plan Template
   - Draft CITPO PPQA Plan (v0.1)

4. **Conduct Peer Review**
   - Conduct Program and Project Reviews
   - CITPO PPQA Plan (v0.2)

5. **Conduct Program and Project Reviews**
   - CITPO PPQA Plan (v0.3)

6. **Obtain Approval**
   - CITPO PPQA Plan (v1.0)

7. **Distribute CITPO PPQA Plan**
   - CITPO PPQA Plan (v1.0)

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Perform Process Audit (PPQA-PROC-02)
Perform Work Product Evaluation (PPQA-PROC-03)
Document Version Control (CM-PROC-nn)

Process Asset Library

CITPO PPQA Plan (v1.0)
CITPO PPQA Plan (v0.3)
CITPO PPQA Plan (v0.2)
# Interactive Repository

<table>
<thead>
<tr>
<th>Sequence</th>
<th>Input</th>
<th>Activity</th>
<th>Output</th>
<th>Responsibility</th>
<th>Others Involved</th>
</tr>
</thead>
</table>
| 1        | Integrated Master Schedule
          aaa-PROC-xx
Strategic Plan
          aaa-PROC-xx | Develop Draft PPQA Schedule | Draft CITPO PPQA Schedule          | PPQA Lead      | PPQA Implementers |
| 2        | Draft CITPO PPQA Schedule                                            | Coordinate Schedule                  | CITPO PPQA Schedule (to PPQA-PROC-02 and PPQA-PROC-03) | PPQA Lead      | PI Steering Group
Project Officers |
| 3        | CITPO PPQA Schedule
CITPO PPQA Plan – Template
Attachment 3 | Write Plan                              | CITPO PPQA Plan (v0.1)              | PPQA Lead      | PPQA Implementers |
| 4        | CITPO PPQA Plan (v0.1)                                                 | Conduct Peer Review                  | Review Comments                        | PPQA Implementers | N/A             |
| Review Comments | * Review and Comment                                      |                                      |                                    |                |                 |
|           | * Incorporate Comments                                               |                                      |                                    |                |                 |

Entry Criteria:
The PPQA process is ready to be implemented. (Initial entry)
The CITPO PPQA Plan needs to be updated. (Subsequent entry)

Exit Criterion:
The CITPO PPQA Plan has been approved.
CHANGE IS GOOD.

You go first.
QUESTIONS?