A LEAN and RACI Approach to CMMI for Services (CMMI-SVC)

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SPAWAR SYSTEMS CENTER PACIFIC (SSC-Pacific)
US NAVY
OUTLINE

▼ Background about SPAWAR Systems Center Pacific
▼ Why this approach?
▼ What is RACI?
▼ How to populate RACI?
▼ Mapping RACI into CMMI SVC Specific Practices
Space & Naval Warfare Systems Center Pacific – SSC Pacific

▼ DOD US NAVY Organization

- 4000 + Scientists & Engineers
- Located in San Diego, and throughout the Globe
Mission ~ Information Dominance

Design, Build, and Sustain C4ISR Information Dominance Systems

(Radar, Networks, Command and Control, Crypto Devices, Satellites communications, Submarines Electronic Systems, etc… )
Systems Engineering for Mission Success

- Reliability
- Availability
- Maintainability
SSC Pacific CMMI Timeline

1988
• Implemented Software (SW) Capability Maturity Model CMM - predecessor of CMMI model.
• Systems Engineering Process Office (SEPO)

2000
• Attained SW-CMM Level 3 in October 2000.
• SSC PAC transited from SW-CMM to CMMI- DEV model and continues with its process improvement road.

2009
• Implementing CMMI-SVC ML2 model 1.2 for Services projects
• Achieve CMMI-DEV ML3 on 2012
SSC Pacific CMMI SERVICES

- Diversity of projects involved in systems engineering services, Research and Development (R&D), logistic, maintenance, sustainment, etc.
- Some are non-product-oriented projects do not maximize the benefits of CMMI-DEV initiative
- 2009 adopted CMMI-SVC, version 1.2 to improve the projects’ performance and quality for non-product-oriented projects
Approach to gather Artifacts for CMMI?

▼ Traditional
- Mapping business process into the CMMI Model
  - Business must learn, and speak CMMI
  - Steep learning curve
  - Time consuming

▼ Lean
- Begin with the existing “as-is” business process mapping
  - Ask the questions to gather the artifacts:
    1. What process is been performed?
    2. How is the process being performed?
    3. Why the process is been performed?
    4. Who are the process role-players?...
Example of “as-is” Business Process

<table>
<thead>
<tr>
<th>Functionary &amp; Tools</th>
<th>WHAT</th>
<th>HOW</th>
<th>VIA</th>
<th>WHY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work Plan Task Management</td>
<td>Function</td>
<td>Processes</td>
<td>Drivers, Purpose</td>
<td>Requirement REFERENCES &amp; reasons (e.g., Best practices)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pre-Planning</th>
<th>Funds Management</th>
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</thead>
<tbody>
<tr>
<td>Design Review</td>
<td>Cost Est V&amp;V</td>
</tr>
<tr>
<td>POA&amp;M Development</td>
<td>Actual Cost MRN&amp;C</td>
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<tr>
<td>SKED De-confliction</td>
<td>Biz Mgt Grp</td>
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<tr>
<td>CETTracker Review</td>
<td>CETTracker</td>
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<td>SPIDER Review</td>
<td>ERP</td>
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<td>FPY Hot Wash Review</td>
<td>EVM Reports</td>
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<tr>
<td>Performance Agreements</td>
<td>Performance Agreements</td>
</tr>
<tr>
<td>GFE/GFM Timelines</td>
<td>Minimize Est-to-Act Cost Var</td>
</tr>
</tbody>
</table>

- Minimize Est-to-Act Cost Var
- Cost Est V&V
- Actual Cost MRN&C
- Biz Mgt Grp
- CETTracker
- ERP
- EVM Reports
- Performance Agreements
- Minimize Est-to-Act Cost Var

We are the Navy experts in delivery and sustainment of C4ISR systems
Continuous Process Improvement
A Concept of Operations (CONOPS)

<table>
<thead>
<tr>
<th>Organizational Aspect</th>
<th>Functions</th>
<th>Processes</th>
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</thead>
<tbody>
<tr>
<td>BUSINESS</td>
<td></td>
<td></td>
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<tr>
<td>(What we do, day-to-day)</td>
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<td></td>
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<tr>
<td>OPERATION</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(How we do What we do IAW Policies &amp; Processes)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Top-Down Diagrams
- Flow Diagrams
- SIPOC Diagrams
- RACI Matrix
- Value Stream Map (VSM)
- Value Stream Analysis (VSA)
- Proposed LSS Projects
- LSS Project Queue
- Project Execution
- Improvement

We are the Navy experts in delivery and sustainment of C4ISR systems
What is RACI Matrix?

- Pronounced “racy” or “rack-y”
- A.K.A. RACI-ARCI Matrix
  - Although ARCI more accurately reflects left-to-right hierarchical roles, RACI seems to be the acronym most widely used in industry
- Useful in project management
  - WHO does WHAT, WHEN
- Useful in Continuous Process Improvement (CPI) and Lean/Six Sigma; facilitates “as-is” to “to-be” organization planning and process management
  - WHO does WHAT, WHEN, WHY
  - CTQ Outcomes; Time & Cost per process step; etc.
- Used to assign or describe cross-functional process-related roles
- Used to develop business rules for process streamlining & automation
<table>
<thead>
<tr>
<th>Role</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td><strong>Responsible</strong></td>
<td>Those who do work to achieve the task. The role of Responsible includes support, which is to provide resources to complete the task. Responsible is about doing the work; several, or all, may share responsibility. Responsible is linked to the function(s) assigned to execute a particular activity. The degree of responsibility is determined by the Accountable person.</td>
</tr>
<tr>
<td><strong>Accountable</strong></td>
<td>(Also Approver or final Approving authority) Those who are ultimately accountable for the correct and thorough completion of the task. Accountable is the one to whom “R(s)” are accountable. There must be only one A specified for each task. The role of Accountable may include Responsible; in other words, it is not unusual that the one who is Accountable for a task is also Responsible to do the work to achieve the task. Accountability cannot be delegated.</td>
</tr>
<tr>
<td><strong>Consulted</strong></td>
<td>Those who must be ‘consulted’ before decision or activity is finalized. A two-way communication (a negotiated consensus).</td>
</tr>
<tr>
<td><strong>Informed</strong></td>
<td>Those who must be notified about the completion or output of decision or activity. A one-way communication.</td>
</tr>
</tbody>
</table>
**R A C I**

A tool for assigning cross-functional roles.

- **R** RESPONSIBLE
- **A** ACCOUNTABLE
- **C** CONSULTED
- **I** KEEP INFORMED

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<table>
<thead>
<tr>
<th>MISSION/CHARTER TASK</th>
<th>CAPTAIN</th>
<th>NAVIGATOR</th>
<th>1/2 OFFICER</th>
<th>CHIEF ENGINEER</th>
<th>PURSER</th>
<th>STORES PROVISIONS</th>
<th>PORT AUTHORITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;To Ready &amp; Deploy the Ship&quot;</td>
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<table>
<thead>
<tr>
<th>MILESTONE / TASK</th>
<th>CAPTAIN</th>
<th>NAVIGATOR</th>
<th>1/2 OFFICER</th>
<th>CHIEF ENGINEER</th>
<th>PURSER</th>
<th>STORES PROVISIONS</th>
<th>PORT AUTHORITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 CHART ROUTE</td>
<td>C</td>
<td>R/A</td>
<td>I</td>
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<td>2 ORDER PROVISIONS</td>
<td>C</td>
<td>C</td>
<td>R/A</td>
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<tr>
<td>3 ORDER FUEL</td>
<td>C</td>
<td>A</td>
<td>R</td>
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<td>4 GAIN APPROVAL TO LEAVE</td>
<td>A</td>
<td>R</td>
<td>R</td>
<td>R</td>
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<tr>
<td>5 SET SAIL</td>
<td>A</td>
<td>C</td>
<td>R</td>
<td>I</td>
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<tr>
<td>6 TAKE CONTROL FROM PILOT</td>
<td>R/A</td>
<td>I</td>
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**Functions**

are assigned roles in the process.

**Activities**

include all the tasks that need to be completed, as well as the decisions that need to be made.

- Responsible is about doing the work; several, or all, may share responsibility.
- Accountable is defined as 'the buck stops here'; only one individual can be accountable.
Mapping RACI – CMMI Process Areas

<table>
<thead>
<tr>
<th>CPI LSS RACI MATRIX</th>
</tr>
</thead>
<tbody>
<tr>
<td>11th Annual CMMI Technology Conference</td>
</tr>
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</table>

**PROCESS STEPS**

Executed by **Primary & Secondary / supporting Competencies (Roles) --->**

(As possible, start with an ACTION VERB; e.g., Conduct, Review; Develop; Provide, Analyze, Test, Validate, Verify, Certify, Approve, Deliver, etc.)

<table>
<thead>
<tr>
<th>Processes</th>
<th>CMMI/PA</th>
<th>PM/CHENG</th>
<th>Software Team</th>
<th>Subject Matter Expert</th>
<th>Install Lead</th>
<th>CM</th>
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<td>Pr S1</td>
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<td>S2</td>
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<td>S5</td>
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**Software Support Activity (SSA)**

1. Review request for update/change to established system configuration.
2. Determine cost and feasibility of implementing the change.
3. Review applicable requirements documentation.
4. Determine if an available COTS solution exists.
5. Select the best solution candidate(s).
6. Determine if the cost of implementation over $50K?
   6a. If NO, then go to step 8
   6b. If Yes, then next step.
7. Complete a white paper for submission with the Preliminary ECP/ECR.
8. Request appropriate forms from the appropriate CM analyst.
9. Copy the SSA templates into a new folder created specifically for the software ECP/ECR in "Working Software ECPs/ECRs".
10. Fill in the appropriate form after the SSA ECP/ECR forms have been filled in by a SSA rep.
Project-to-Process-Agent Interactions:

- **Project Activities**
  - Maintain

- **Coaching and collaboration for potential process updates**

- **Process Agent Activities**
  - Maintain

- **RACI Matrix**
- **PIIDs of CMMI compliance**

- **Map**
- **Monitor**
Mapping CMMI practices to RACI matrix

- Completed by the Process Group (PG) who are experts in CMMI structure and content
  - CMMI practices (as mapped) cited within RACI matrix first
    - Can be easily identified and initially cited in broad percentages within project instantiations (work areas)
  - Next CMMI table of process implementation indicators (PII) is populated with RACI content
    - links to data in the RACI matrix content
  - Identify model gaps within RACI matrix and CMMI table and provide feedback to project staff in broad percentages first
    - Additional detail may or may not be deemed relevant
Mapping CMMI practices to RACI matrix

- Gaps may be with respect to the RACI template itself or its content
- Gaps are explained to staff in project terminology based on project needs and objectives

“Main product” is an improved organization with evidences provided in updated and improved RACI matrices

“By product” is a populated CMMI Process Improvement Indicator (PII) table with current artifacts of implementation organized and current for appraisal purposes
Overarching RACI Matrix

There will be gaps from RACI because of its as-is business nature and content

- Gaps are to be analyzed for project relevance, not automatically addressed or even assigned as action items without a “business case” first
- If gaps result in business-case actions to be addressed, there will be facilitative communication to the project using their own pre-existing (non-CMMI) work terminology
Thank you !!!

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