



# CMMI as a Process Improvement Tool

Presented by:

Jeff Rold and Nancy Fleischer

Raytheon Space and Airborne Systems

# Presentation Outline

- **Continuous Process Improvement**
- **Process Improvement Implementation**
- **Effective Use of the CMMI model for Process Improvement**
- **Reality of a Large Scale Process Improvement**
- **Reality of a CMMI Appraisal**
- **Impediments**
- **CMMI use in Procurement Activities**

# Continuous Process Improvement

- Successful change initiatives in businesses have
  - Connection to real goals
  - Connection to real business performance
  - Involve people who can make a difference (empowered)
  - Balance action and reflection with experimentation
  - Focus on learning and evolution
- Continuous improvement means it never ends
- Continuous means perfection cannot be expected
- Continuous means it evolves like a living organism
- Capability Maturity Model Integrated aims toward a level 5 optimizing organization which continuously improves their standard processes/organizational behaviors

# Process Improvement Implementation

- The Steps are Simple:
  - Imagine the “should be state” of performance
  - Examine where you are, (**Measure** where you are)
  - **Standardize** (simple) process
  - Eliminate waste
  - Determine **root cause** of systemic issue
  - Try a new method which addresses the root cause
  - Measure the result
  - If result is positive, Widely deploy the new process
- Celebrate successes and achievements along the way to provide additional incentives to continue the journey.
- This requires TIME, ENERGY (i.e., LEADERSHIP), and RESOURCES

# Effective Use of the CMMI model for Process Improvement

- CMMI helps drives process improvement by
  - Providing a model of “best practices”
  - Providing a consistent and thorough measurement assessment methodology
  - Providing the “practices” to support the continuous process improvements steps
  - Allowing selection of focus improvement areas for an business through segregation of Process Areas
  - Providing some sequencing to process improvement in stages or levels of maturity
- CMMI appraisals measure improvement progress
  - Reveals development, growth, maturation of an organization

# Reality of a Large Scale Process Improvement

- Remember the steps?
  1. Imagine the “should be state”
  2. Examine where you are
  3. Standardize process (document the process)
  4. Eliminate waste
  5. Determine root cause of systemic issue
  6. Try a new method which addresses the root cause
  7. Measure the result
  8. Widely deploy the new process
- These steps must be followed for each of 485 practices for CMMI based improvements (Step 1)
  - How long would it take to deploy these practices in an organization of 10,000 people if the organization had none of the practices in place?
- Most organizations have had these practices in place for many years
  - We start by mapping existing process to model practices- (step 2)
  - And then fill gaps, using the model to identify the gaps

# Reality of a Large Scale Process Improvement

- Improvements need to be prioritized, managed and introduced into the organization (OID)
  - In large organizations, It is not realistic for changes to occur overnight. Transition will be gradual
  - The goal is steady progress in process improvement
- CMMI requires a process to measure deployment but does not require 100% compliance
- It becomes a balancing act of scope. And is solely based upon what the business is trying to accomplish
  - Transition can be done over smaller organizational units
  - However, this may undermine the business goals
  - Benefits of organization consistency are important across the entire business
  - Tradeoffs for the scope of deployment are examined from the cost benefit ratio to the business
  - May be more efficient to standardize across a wide scope (when process is independent of specifics of the product)
  - Imposition of cost and schedule delays to update existing program processes deter implementation on existing programs in later life cycle stage

# Reality of a Large Scale Process Improvement

- Balancing act must also consider reality of appraisal process and customer expectations
- New Processes are introduced to the programs using practicality and judgment
  - We live in a reality where guidelines, recommendations, and exceptions to directives must be considered
- Realities of cost effectiveness may dictate application of the latest CMMI-driven process
  - Considerations such as
    - Cost to retrofit existing programs
    - Value add as a function of program lifecycle phase
    - Size of the program team
    - Program deliverable usage (i.e., Proof of concept might be different from a fielded system)
    - Customer valued
  - The method does expect programs to instantiate the processes as appropriate to their lifecycle.



# Reality of a CMMI Appraisal

- Appraisals are Expensive
  - 485 practices. Each one has direct evidence and the general expectation is for 2 forms of indirect evidence, even though the method only requires one and an affirmation. Evidence must be collected before the appraisal. Requires evidence from at least 3 programs, and 2 instances of each practice. Requires evidence from the organizational (infrastructure).
  - Most appraisal teams need more evidence to be convinced that “long term existing processes” really do answer the model
  - Our last (SAS) appraisal had over 8,000 artifacts of evidence
- Appraisals review a “representative set” of programs from the business. Not every program.
- It becomes more difficult to perform appraisals across a large scope organization
- However, doing many smaller appraisals is multiplicatively more expensive
- Given existing methodology it is not possible to cover every program

# Impediments

- Current industry focus appears to be on level rating and not on the continuous process improvement
  - Impression is “pass the test”, get the rating and be done with this initiative
- Appraisals have become compliance audits, and are missing the big picture
  - Model should be used to encourage industry to “measure your performance and improve it over time”
  - Appraisal should be focused on process robustness in support of continuous improvements
- Expectation is perfection and suppliers can be relied upon to deliver on cost and schedule based upon one appraisal without attention to improvements over time

# Impediments

- Widely sharing appraisal findings inhibits open and honest ability to address areas needing improvement
- Limited proof that this will lead to a return on investment
  - Conflict over “what is the basis for using CMMI as a model- has it been proven to improve businesses?”
  - Conundrum-You cannot prove ROI unless you start the journey and begin measuring performance.
- Impatience- Process improvements that sustain cannot be made “overnight”
- Unwillingness for customers to pay for processes

## CMMI use in Procurement Activities

- CMMI can be used for driving Process Improvement
- CMMI can be used for assessing the risk of doing business with a supplier
- The Key question is how?
- We look forward to continued discussions on this subject

## CMMI use in Procurement Activities

- When Evaluating a Supplier, the Government should
  - Look for past appraisal scope and results
  - Look for a process standard in the company? (Yes if the org is rated level 3)
  - Look for identified processes that are to be statistically analyzed and controlled based on the organizations needs and objectives. And, the programs use the baselines of product quality and process performance to manage their processes. (Yes if org is rated level 4)
  - Look for a robust organizational process improvement activities with measures tied to business goals. (Yes if Org is rate level 5)
  
- For evaluating a specific similar program
  - Does the organization have the infrastructure to ensure that the standard processes are implemented on specific programs
    - Are deviations from standard recorded in some form (often called tailoring).
    - Are deviations justified to the organization's satisfaction
  - Perhaps review the results (looking at artifacts) of the Process and Product Quality Assurance and Objective Evaluation activities would tell the story

## CMMI use in Procurement Activities

- Leadership provided from the government
  - Drive CMMI based improvement expectations for all suppliers (down every tier)
  - Stop disagreement about the need to pay for practices and tasks that are directly part of the model
  - Reiterate the value proposition - the government must believe and support the ROI for this model usage
- CMMI will be embraced in every program if our customers see value in process improvement and encourage (demand) it with appropriate resources



# Back-Up

## Appraisal Pitfalls

- For Process Improvement
  - Make sure your appraisal team focuses on the big picture of business performance predictability and helping the business to improve
  - The goal is not to find something wrong but to help the organization perform better
- For Procurement
  - The procurement team should assume a level rated organization is compliant to their processes and scrutinize the “findings” of the Objective Evaluations performed within the organization
- Focus appraisal on the organization’s process not what is “expected” from generic model language