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Space and Airborne Systems

# Raytheon's Six Sigma Process and Organizational Innovation and Deployment A Perfect Fit

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# Outline

- Raytheon Six Sigma (R6σ)
- The Basic R6σ Process and Tools
- R6σ and Organization Innovation and Deployment
- R6σ is Optimizing Processes- Level 5

# Raytheon Six Sigma (R6σ)

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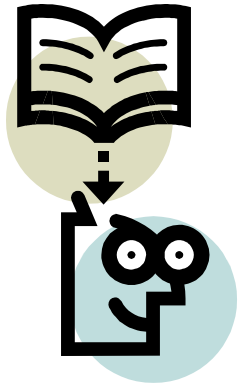
R6σ is a

**Knowledge Based Process**

we will use to

**Transform Our Culture**

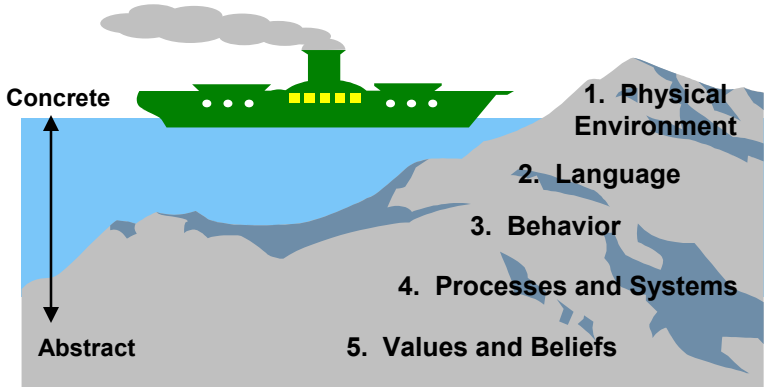
in order to



**Maximize Customer Value**

and

**Grow Our Business**




# Raytheon Six Sigma (R6σ)

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- Tenets
  - Specify value in the eyes of the customer
  - Identify value stream
  - Simplify the steps and eliminate waste & variation along the value stream
  - Make value flow at the pull of the customer
  - Involve and empower employees
  - Continuously improve knowledge in pursuit of perfection
- Approach
  - Simple standard process
  - Tools to focus on measurements
  - Measures become knowledge

***Tenets of Raytheon Six Sigma are the same as "Lean"***

# The Basic R6σ Process

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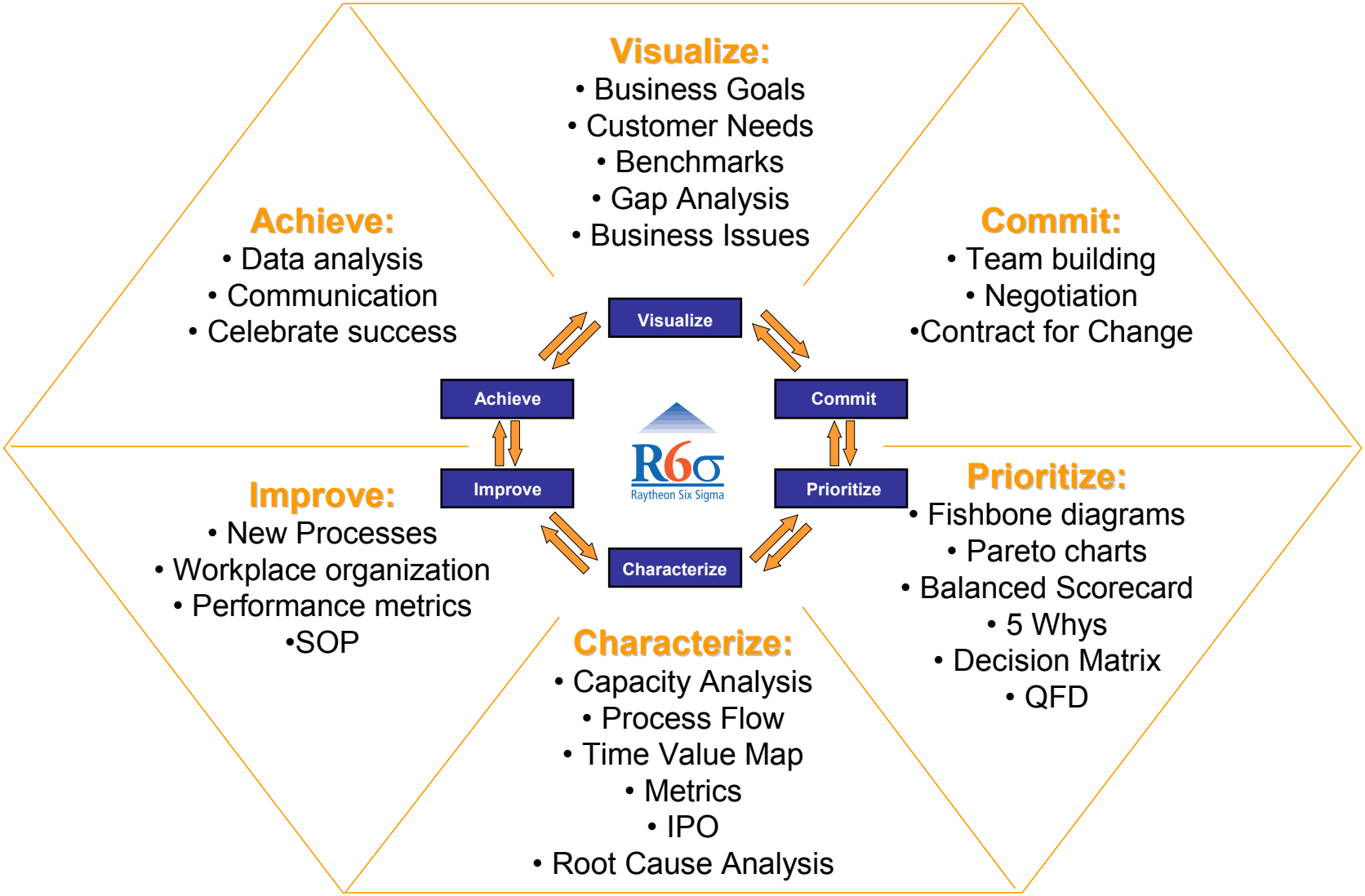

# The Basic R6σ Process

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- Visualize: •Problem Statement •Vision of the Future •Best Practice (model)
- Commit: •All Stakeholders •Sponsorship •Resources
- Prioritize: •Develop Criteria •Decision Analysis •Gap Assessment
- Characterize: •Identify value stream •Root cause analysis •Assessment
- Improve: •Monitor metrics •Train personnel •Deploy •Institutionalize
- Achieve: •Improve metrics •Share lessons, best practices •Share Knowledge •Celebrate

**Provides the framework for activities . . .**

**. . . to make changes in an organizational process.**

# The Basic R6σ Process

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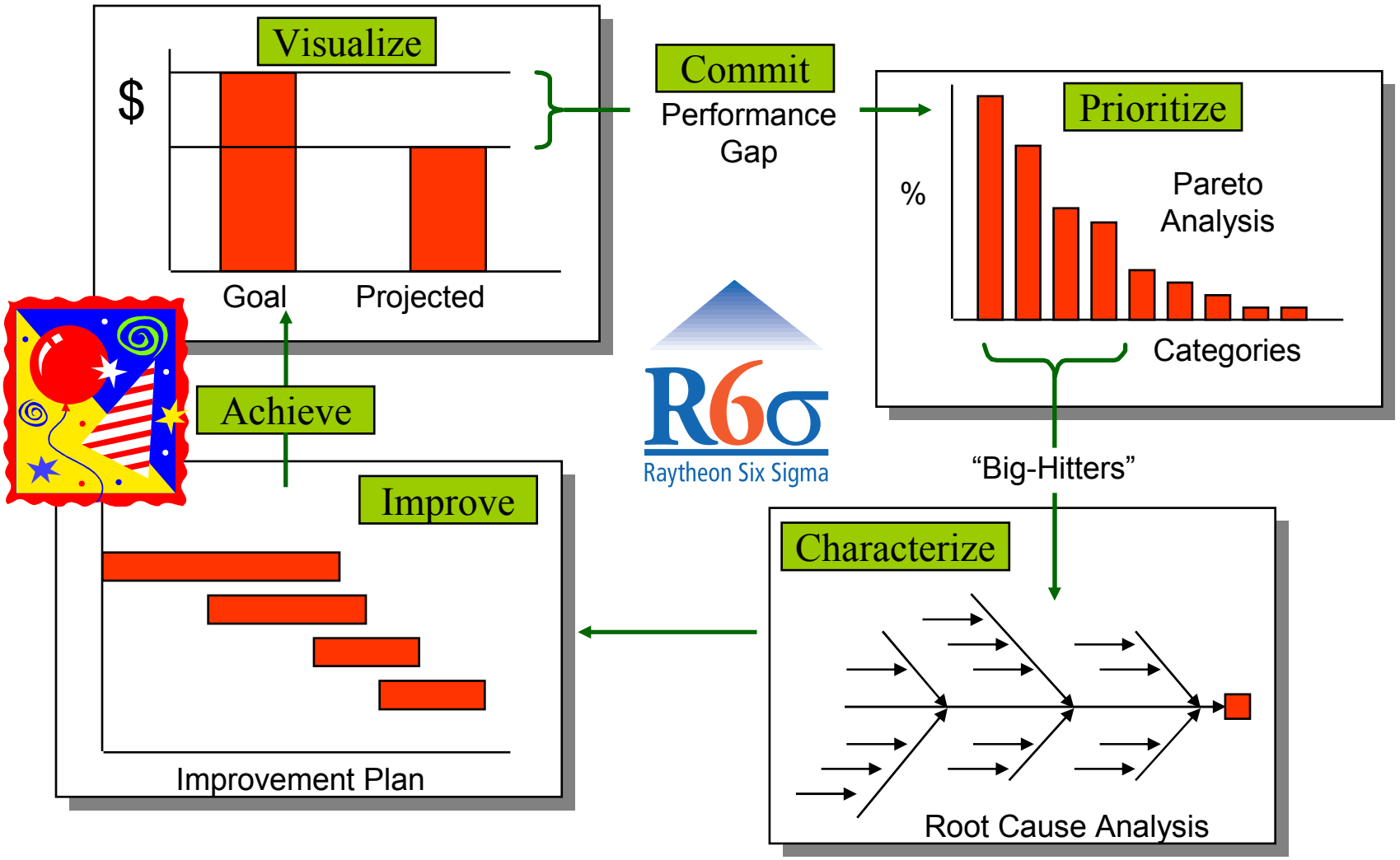

# R6σ Applied to CMMI Process Improvement

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- For Product Development Process
  - Knowledge Based Process (facts and measured process data)
  - Transform Culture (mature processes quickly in steps that provide sustained change)
  - Maximize Customer Value (discipline without bureaucratic waste)
- This institutionalized process is used to support rapid maturation and model compliance
- By application of the tenets, methods, process and tools in organizational business processes

# R6σ and CMMI Organizational Innovation and Deployment

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- Organizational Innovation and Deployment
  - SG 1 Select Improvements
    - SP 1.1-1 Collect and Analyze Improvement Proposals V/P
    - SP 1.2-1 Identify and Analyze Innovations V/P
    - SP 1.3-1 Pilot Improvements C
    - SP 1.4-1 Select Improvements for Deployment C
  - SG 2 Deploy Improvements
    - SP 2.1-1 Plan the Deployment I
    - SP 2.2-1 Manage the Deployment I
    - SP 2.3-1 Measure Improvement Effects A

V= Visualize; Co= Commit; P= Prioritize; C= Characterize; I= Improve; A= Achieve

# R6σ A Typical Project

- Organizational Innovation and Deployment
  - SG 1 Select Improvements
    - SP 1.1-1 Collect and Analyze Improvement Proposals
      - Visualize- A Program has had a vendor supplied part which has failed in verification tests at a higher level of assembly
      - Visualize- Root Cause was determined to be a specification change that was not communicated
      - Commit- A team is formed to develop improvements
      - Prioritize- Brainstorming and current state characterization yield several ideas
      - Prioritize- The team prioritizes ideas based upon the difficulty and the benefit ratio
    - SP 1.2-1 Identify and Analyze Innovations
      - Characterize- One idea requires an automated tool shared with the vendor which was identified from another business (benchmarking)
    - SP 1.3-1 Pilot Improvements
      - Characterize- Develop a pilot to try out the new innovation (automated tool)
      - Characterize- During the usage it was determined that there would need to be an improved licensing arrangement and the training was inadequate
      - Characterize- Measure the current state requirements flowdown to the vendor
    - SP 1.4-1 Select Improvements for Deployment
      - Characterize- Lessons from the pilot are folded in to the improvement and the programs where this tool would have most benefit are selected by the team
  - SG 2 Deploy Improvements
    - SP 2.1-1 Plan the Deployment
      - Improve- Assign personnel , educate the users, acquire licenses and install tools
    - SP 2.2-1 Manage the Deployment
      - Improve/Achieve- Monitor the number of programs using it, the number of people trained and assure compliance to the deployment plans
    - SP 2.3-1 Measure Improvement Effects
      - Achieve- Assure the measures of requirements flow down have improved

# R6σ Applied to Organizational Innovation & Deployment

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**•Create an organization that selects and deploys improvements that can enhance the organization's ability to meet its quality and process-performance objectives**

•Measure the effects of the deployed process and technology improvements
•Analyze the progress toward achieving the organization's quality and process-performance objectives and take corrective action as needed
•Capture decisions, results and revise as necessary

•Establish a method for collecting and analyzing process and technology improvement proposals, and for identifying and analyzing innovations
•Identify potential barriers and risks to deploying each improvement
•Estimate cost, effort and schedule required for deployment


•Select process and technology improvement proposals for deployment and incorporate into organizational process assets, as appropriate
•Plan and manage the deployment

•Identify process/technology improvements that are innovative
•Determine when to pilot improvement
•Prioritize candidate process and technology improvements for deployment

•Pilot improvements and analyze evaluation reports and lessons learned from pilots
•Analyze the organization's set of standard processes to identify where innovative improvements would be beneficial
•Investigate innovative improvements that may improve the organization's set of standard processes
•Analyze potential innovative improvements to understand their effects on process elements and predict their influence on the process
•Analyze the costs and benefits of potential innovative improvements
•Create process- and technology improvement proposals for those innovative improvements that would result in improving the organization's processes or technologies

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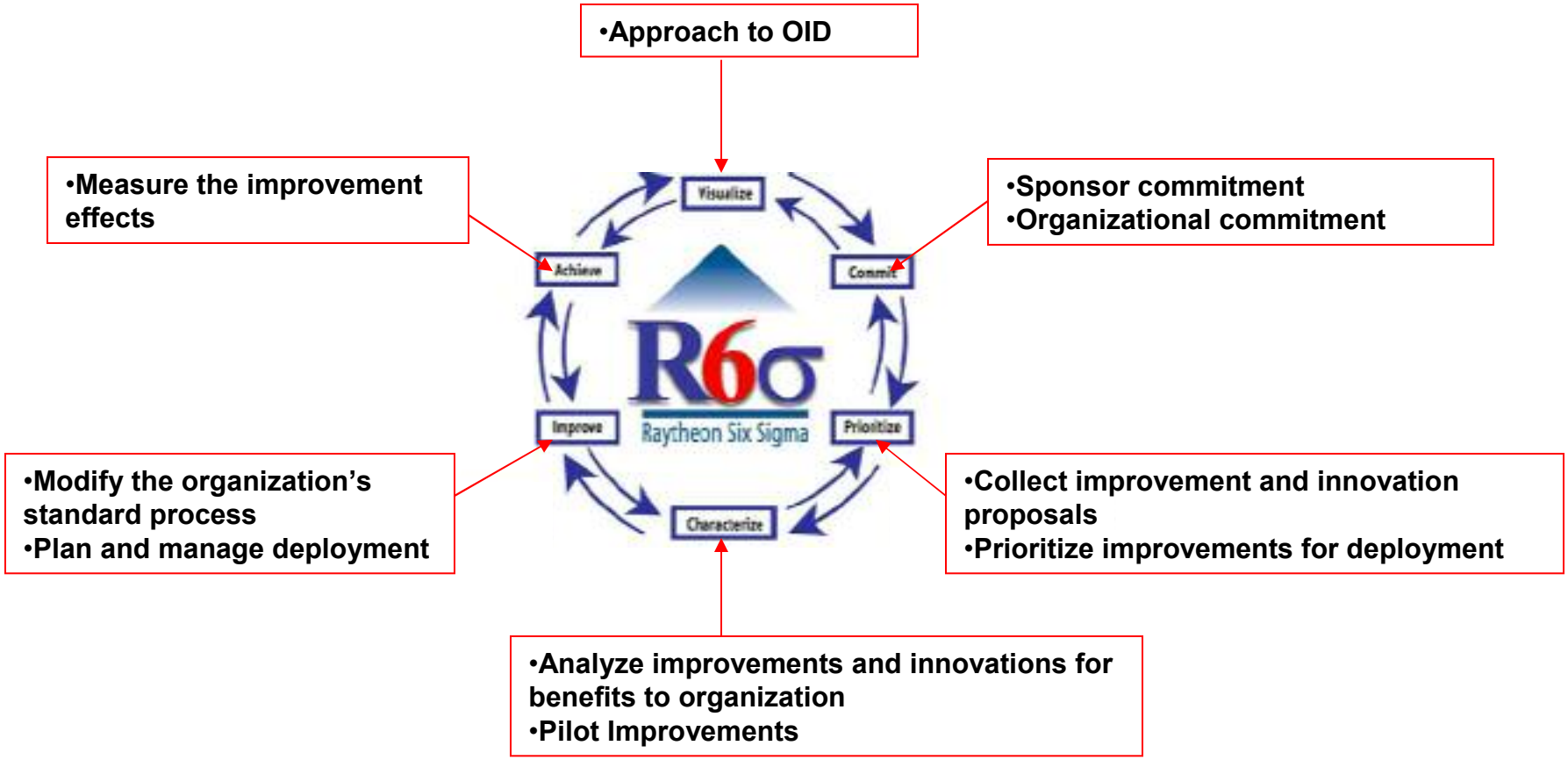

# Optimizing Processes

- At the peak of maturity and institutionalization, CMMI level 5 and Raytheon Six Sigma are very much aligned
- Process Capability ($C_pk$) applied to engineering processes
  - measured and controlled processes with process control limits
  - measured over a significant sample
  - engineering development process can be modeled statistically
  - measured and calibrated over time

***Raytheon Six Sigma is An Institutionalized Process to Achieve Level 5***

# Summary

- R6σ is a knowledge based process transforming Raytheon culture to maximize customer value and grow our business.
- R6σ tenets are the same as "Lean"
- Basic R6σ process (visualize → commit → prioritize → characterize → improve → achieve) provides a framework for organizational process change.
- R6σ genesis was to:
  - Gain production benefits
  - Leverage improvements across the enterprise
  - Focus on the company's value stream
- CMMI OID PA shares R6σ elements
- R6σ accelerates Raytheon's process maturation, and it provides a framework to help drive CMMI efforts across all business areas and disciplines