



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

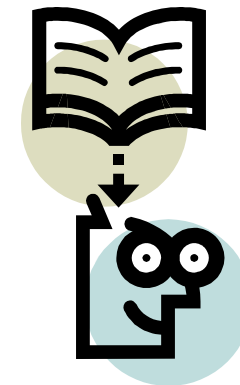




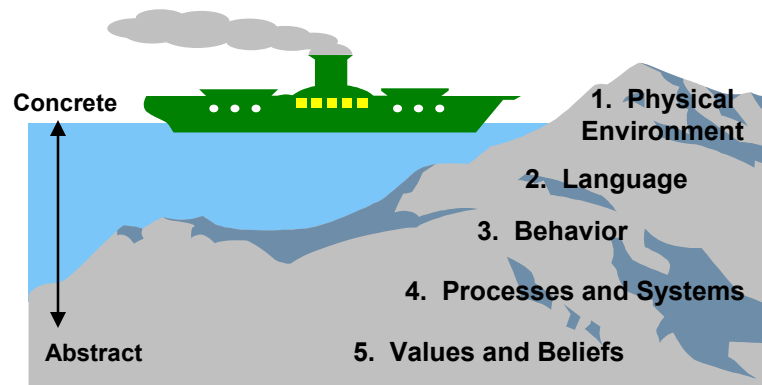
Raytheon Six Sigma (R6σ)

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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 (R6 σ)

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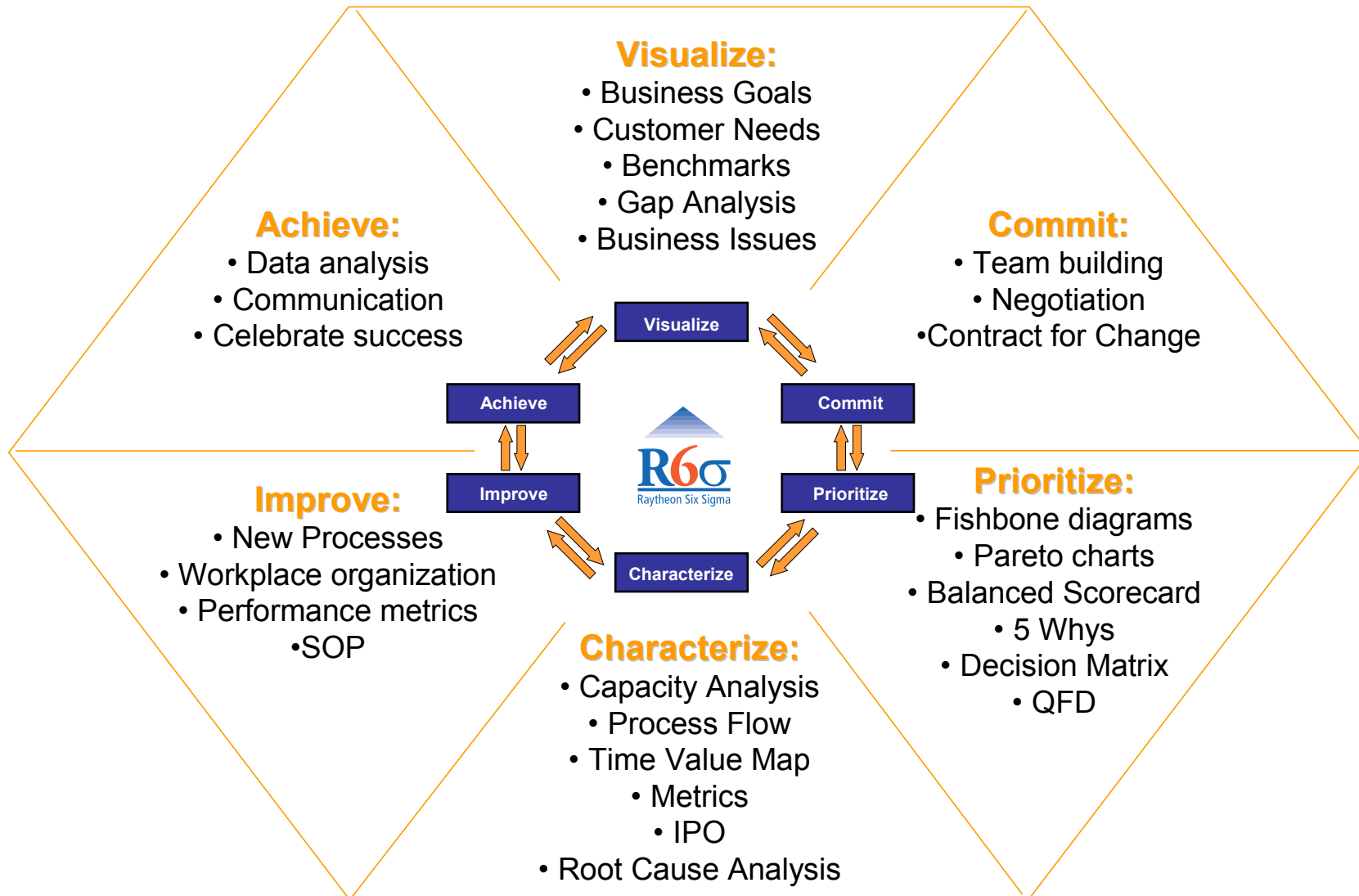
- Tenets
 - Specify value in the eyes of the customer
 - Identify value stream
 - Simplify the steps and eliminate waste & variation along the value stream
 - Make value flow at the pull of the customer
 - Involve and empower employees
 - Continuously improve knowledge in pursuit of perfection
- Approach
 - 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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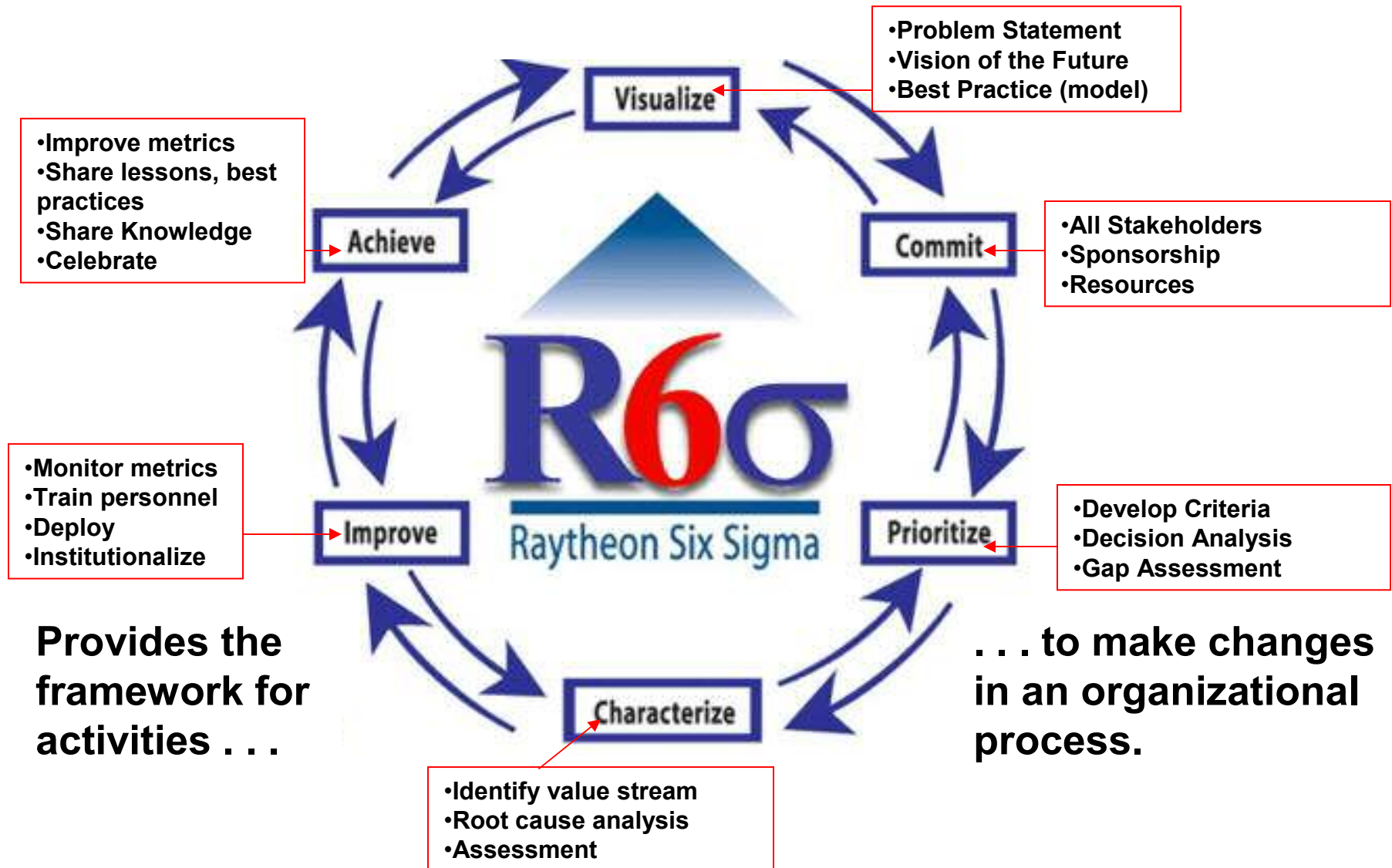




The Basic R6σ Process

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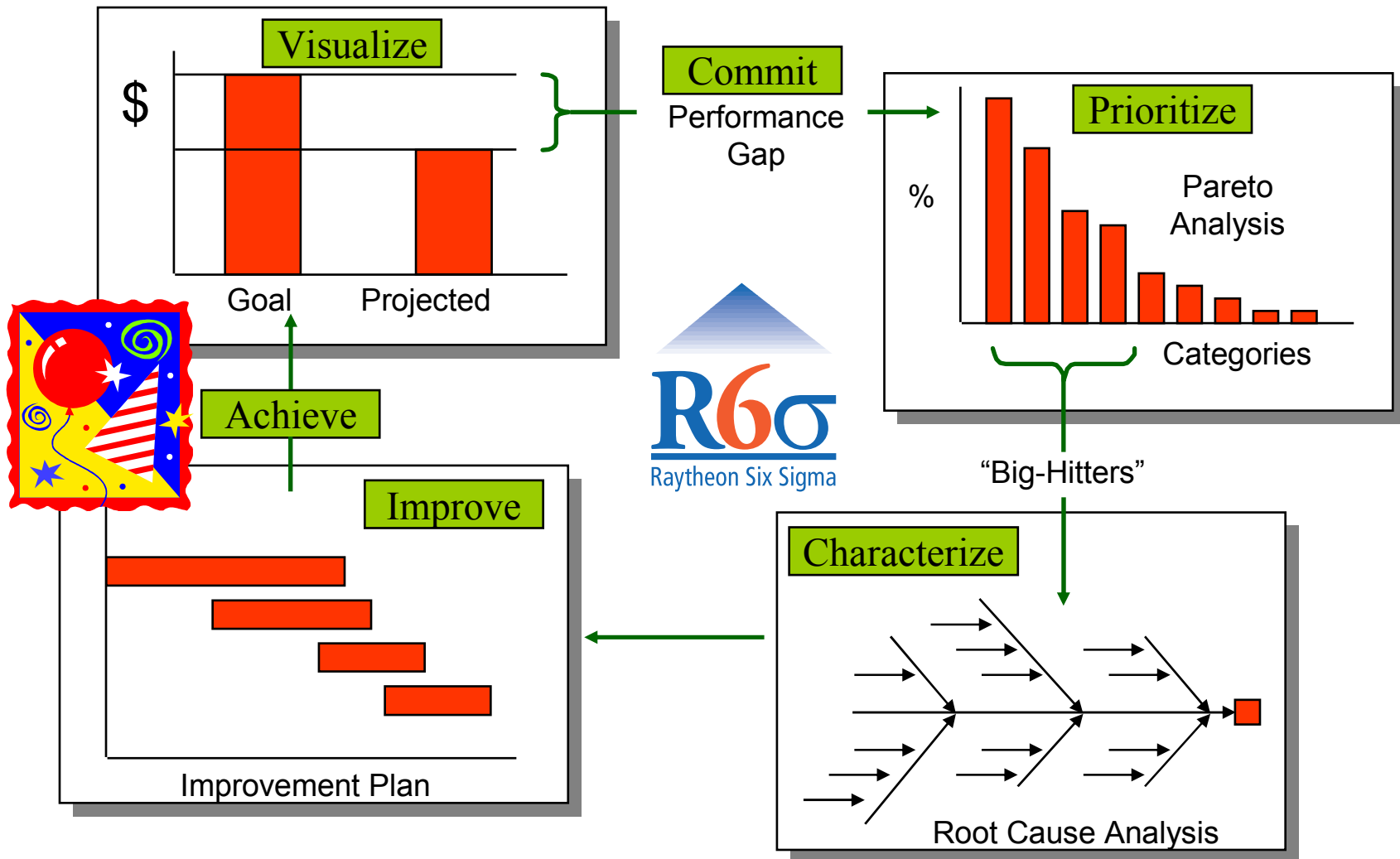
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The Basic R6σ Process

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R6 σ 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



R6 σ and CMMI

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Organizational Innovation and Deployment

- 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



R6 σ 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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- 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

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

- 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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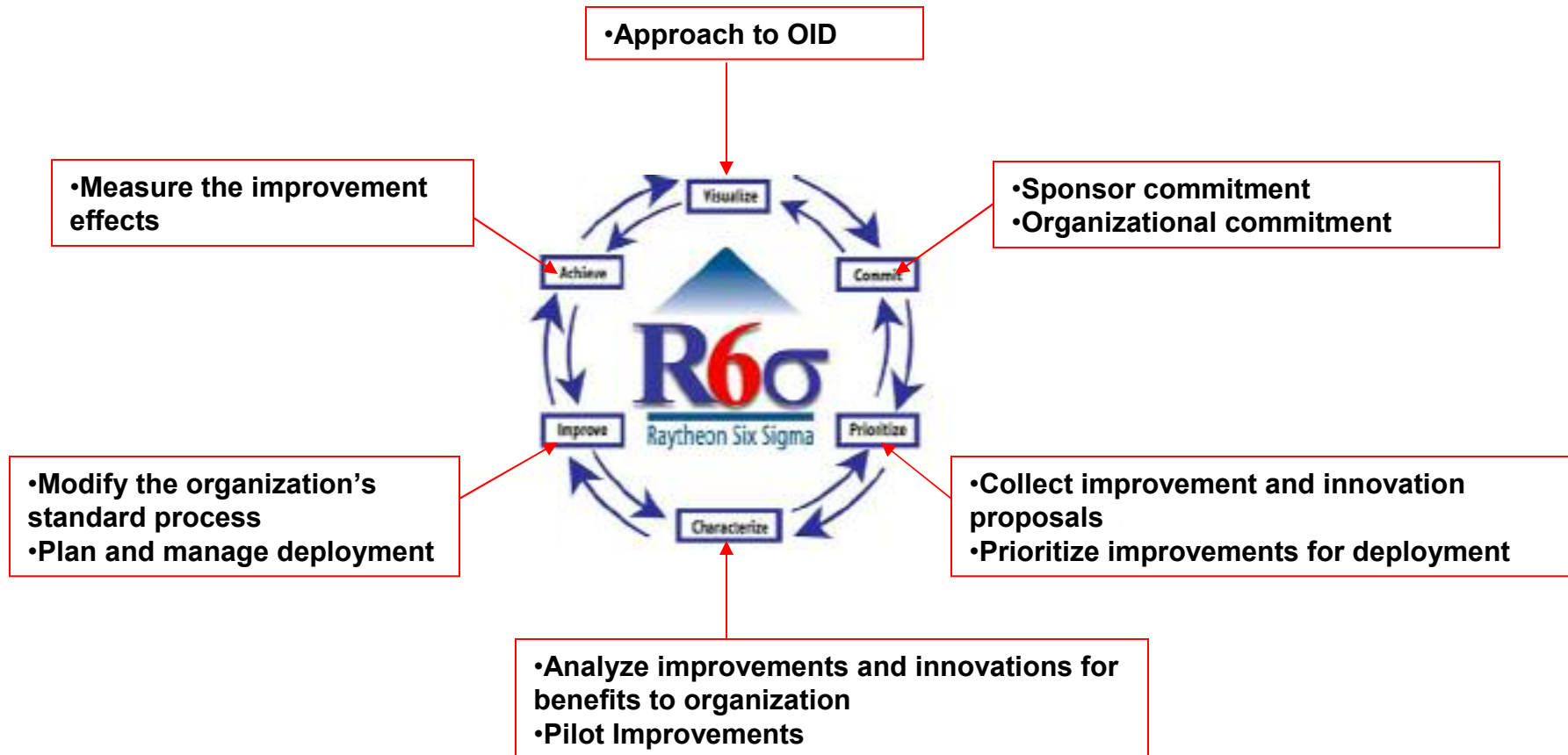
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Optimizing Processes

- 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

- **R6 σ** is a knowledge based process transforming Raytheon culture to maximize customer value and grow our business.
- **R6 σ** tenets are the same as “Lean”
- Basic **R6 σ** process (visualize → commit → prioritize → characterize → improve → achieve) provides a framework for organizational process change.
- **R6 σ** genesis was to:
 - Gain production benefits
 - Leverage improvements across the enterprise
 - Focus on the company’s value stream
- CMMI OID PA shares **R6 σ** elements
- **R6 σ** accelerates Raytheon’s process maturation, and it provides a framework to help drive CMMI efforts across all business areas and disciplines