Making the CMMI® Sing
-
A Framework for Performance Excellence

CMMI® Technology Conference and User Group

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This presentation spans

TWO sessions

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Administrivia

- Trademarks and Service marks
  - ITIL® is a Registered Trade Mark, and a Registered Community Trade Mark of the Office of Government Commerce, and is Registered in the U.S. Patent and Trademark Office
  - IT Infrastructure Library® is a Registered Trademark of the Central Computer and Telecommunications Agency which is now part of the Office of Government Commerce
  - ® CMMI is registered in the U.S. Patent and Trademark Office by Carnegie Mellon University
  - SM SCAMPI is a Service mark of Carnegie Mellon University
- Who I am:
  - Chief Engineer, Jacobs Technology, Inc./ITSS
  - SCAMPI Lead Appraiser
  - (Lean) Six Sigma Black Belt
  - Certified Scrum Master
  - Member, NDIA Systems Engr Steering Committee
  - Member, NDIA CMMI Working Group
  - Member, CMMI-SVC Advisory Group
  - Visiting Scientist, SEI

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Outline

- Goals of a performance improvement approach
- Discovering some driving principles
- Attributes of some performance improvement approaches
- Our journey
- Introducing the Framework for Performance Excellence
- Value propositions of framework components
- Making the Framework sing

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Goals of a Performance Improvement Approach

- Respond to business objectives or solve problems
- Exhibit positive return on investment
- Produce sustainable improvements
- Be transferrable across projects and organizations
- Produce results fast enough to make business sense

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Some Driving Principles

- Focus on performance and quality objectives
- Direct involvement of leadership
- Process ownership
- Improvement velocity

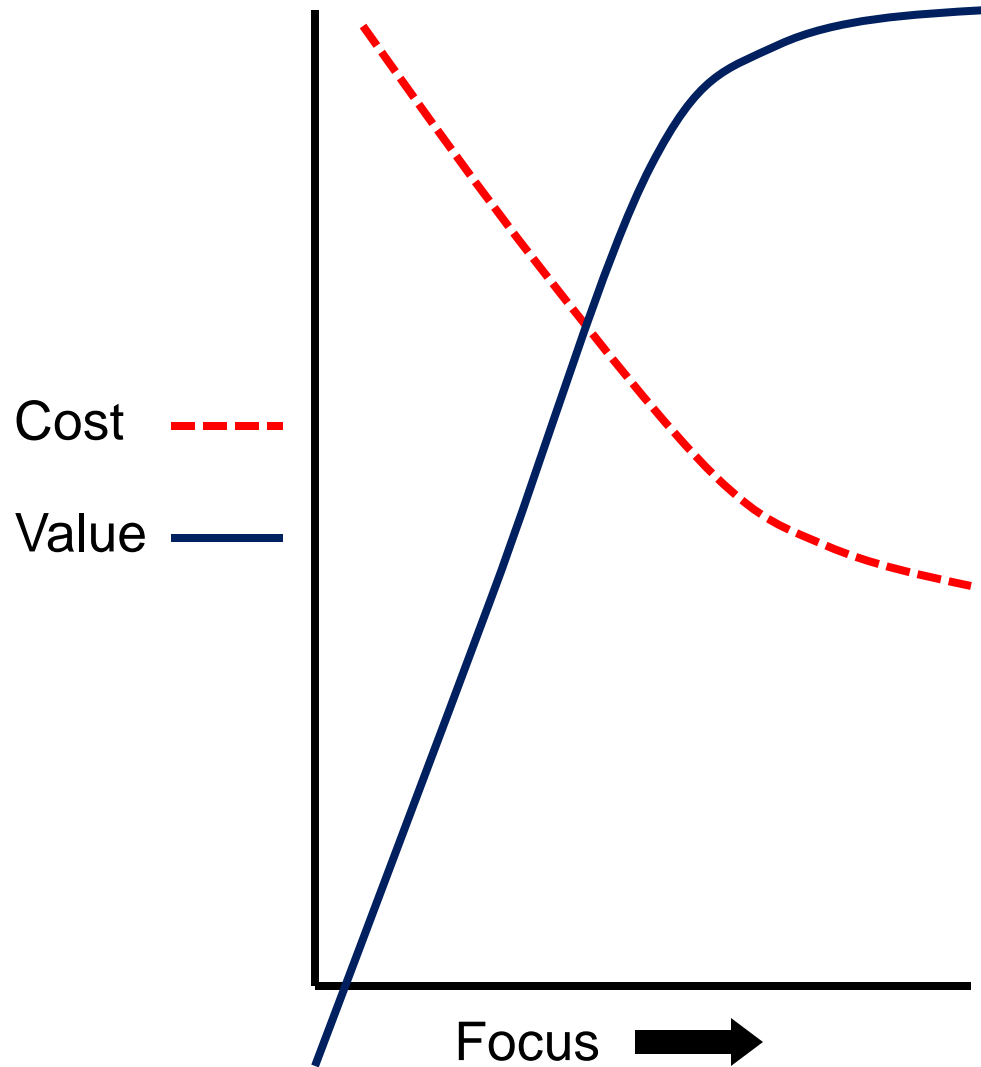**JACOBS**

Focus on Performance/Quality Objectives

- Examples of performance objectives
  - Reduce software life cycle time frame
  - Increase level of service
  - Respond to changes in customer demand in three months or less
  - Reduce cost of development by 35%
- Examples of quality objectives
  - Meet service levels 99.9% of the time
  - Reduce delivered defects to less than 3 per 1,000,000 opportunities

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Why are Performance/Quality Objectives Important?

Because they change **everything**

- The improvement approaches chosen
- Interpretation of CMMI practices
- Workflow measures in Value Stream Mapping
- Measurement objectives
- Which CMMI Process Areas to implement
- What Maturity or Capability Levels to target
- What part of the organization to improve
- How much you're willing to invest

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Return on Investment Envelope

Estimated ROI (vertical axis)

MAXMUM ROI CURVE

Sharp focus on organizational performance and quality goals

WORST CASE ROI CURVE

Opportunity Space

Break-Even Line

Little or no focus on organizational performance and quality goals

Level 2   Level 3   Level 4   Level 5

Focus on Organizational Performance and Quality Goals

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Direct Leadership Involvement

- "Allowing" the organization to improve is often not enough
  - Resources, personnel, money
  - Some level of process/work product review
  - Support for organizational change
  - Approval and support of process changes
- Direct, active involvement is key
  - Tie effort to real business objectives and issues
  - Be demanding of results in a meaningful time frame
  - Set high level performance and quality goals
  - Get "heroes" and key personnel directly and personally involved

LEADERSHIP is key….

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Process Ownership

- Levels of removal from process ownership
  - Hire a professional to come in and write your processes (increasingly rare)
  - Form an SEPG of "process people"
    - Buy-in strategies
    - Dealing with "heroes"
    - Mandates for use of processes (!)
- Ownership by process "doers"
  - Charge the "heroes" with leading performance improvement
  - Exactly as intended by Lean Thinking
  - Make performance improvement <u>everyone's</u> job

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Improvement Velocity

- Velocity = speed in a specific direction
- Improvement "at the speed of business" is the key
- Barriers to high velocity:
  - Lack of focus (objectives, issues, scope, etc.)
  - Lack of leadership
  - Processes not owned by "doers"
  - Low process maturity
  - Misunderstanding of CMMI and other approaches
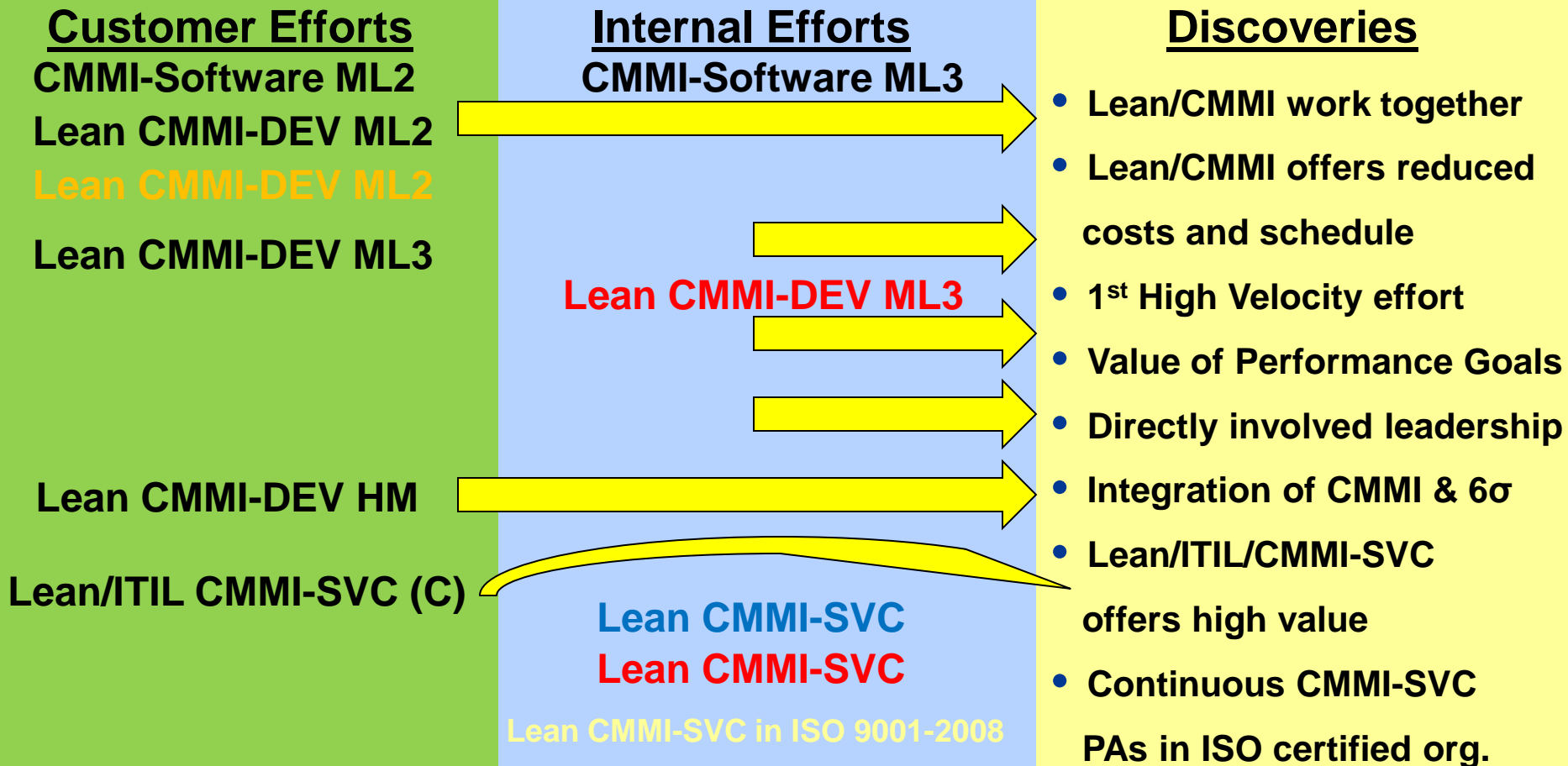
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Attributes of Performance Improvement Approaches

- Lean Thinking:
    - Pros:
    - Cons:

- The CMMI:
    - Pros:
    - Cons:

- The Information Technology Infrastructure Library:
    - Pros:
    - Cons:

- Six Sigma:
    - Pros:
    - Cons:

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Our Lean/CMMI/ITIL/Six Sigma Journey

Customer Efforts

CMMI-Software ML2

Lean CMMI-DEV ML2

Lean CMMI-DEV ML2

Lean CMMI-DEV ML3

Lean CMMI-DEV HM

Lean/ITIL CMMI-SVC (C)

Internal Efforts

CMMI-Software ML3

Lean CMMI-DEV ML3

Lean CMMI-SVC
Lean CMMI-SVC

Lean CMMI-SVC in ISO 9001-2008

Discoveries

- Lean/CMMI work together
- Lean/CMMI offers reduced costs and schedule
- 1st High Velocity effort
- Value of Performance Goals
- Directly involved leadership
- Integration of CMMI & 6σ
- Lean/ITIL/CMMI-SVC offers high value
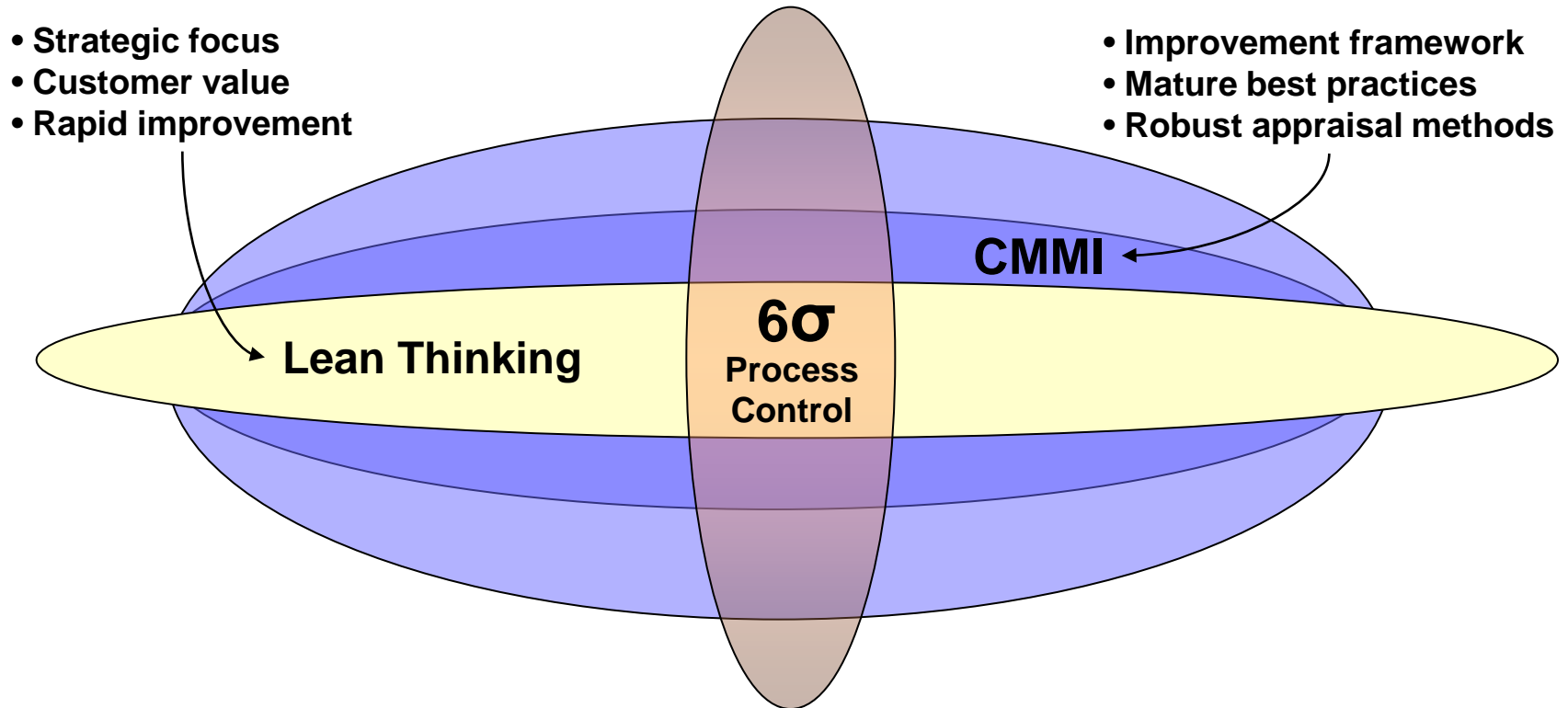- Continuous CMMI-SVC PAs in ISO certified org.

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Outline
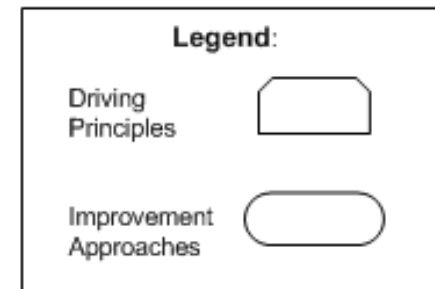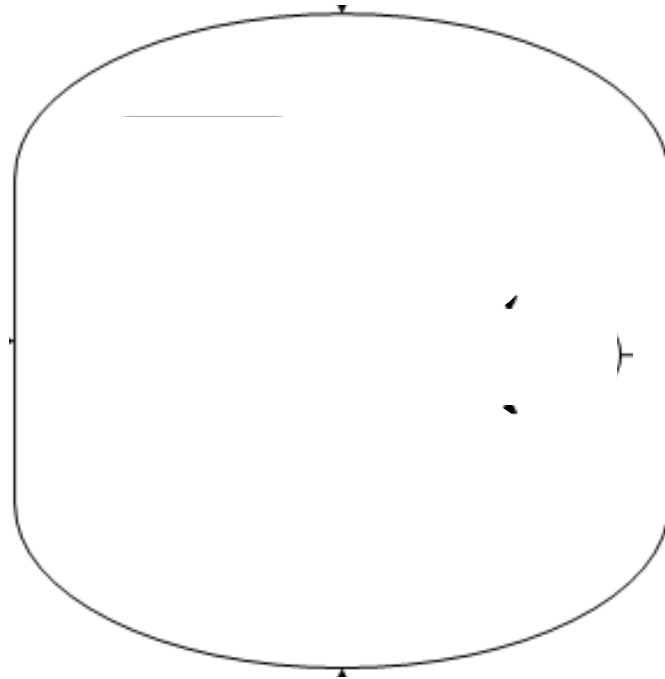
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Lean/CMMI/Sixσ Venn Diagram

- Strategic focus
- Customer value
- Rapid improvement

- Improvement framework
- Mature best practices
- Robust appraisal methods

Lean Thinking

CMMI

6σ
Process Control

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The Framework for Performance Excellence

Legend:

Driving Principles

Improvement Approaches

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Value Propositions for Framework Components

- The CMMI
- Lean Thinking
- Six Sigma
- ITIL

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# Capability Maturity Model Integration

- What is?
  - Models (goals, practices, informative material)
  - SCAMPI appraisal methods
  - Core training (SEI authorized)

- Value proposition:
  - Domain-specific best practices (development, services, and acquisition)
  - Practices for improvement infrastructure
  - Framework for continuous improvement
    - Maturity Levels
    - Process Area Capability Levels
  - Robust, extensible appraisal methods
    - Course correction
    - Learning mechanism
    - Benchmarking

- Downside:
  - No improvement approach or strategy
  - Needs focus and leaning

- Integration with other approaches:
  - Synergistic with Lean
  - Actualizes Six Sigma
  - Implements ITIL

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Lean Thinking

- What is?
  - Focus on customer value
  - Value stream mapping (workflows)
  - Cadence and synchronization
  - Organizational rapid learning
  - Process doers are process owners
  - Reliance on tacit knowledge and skilled team members
  - Agile project management
- Value proposition:
  - High velocity (Presentation Wednesday 8AM)
  - Lean (smart) processes and process efficiency
  - Builds mature teams quickly
  - Rapid response to customer pressures
- Downside:
  - No improvement infrastructure
  - Suffers from lack of consistency and persistence
- Integration with other approaches:
  - Synergistic with CMMI models
  - Leverages Six Sigma
  - Sharpens business context of ITIL

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Degradation Curve for the Lean/Agile Value Proposition

Y-axis: Lean Value (ROI)
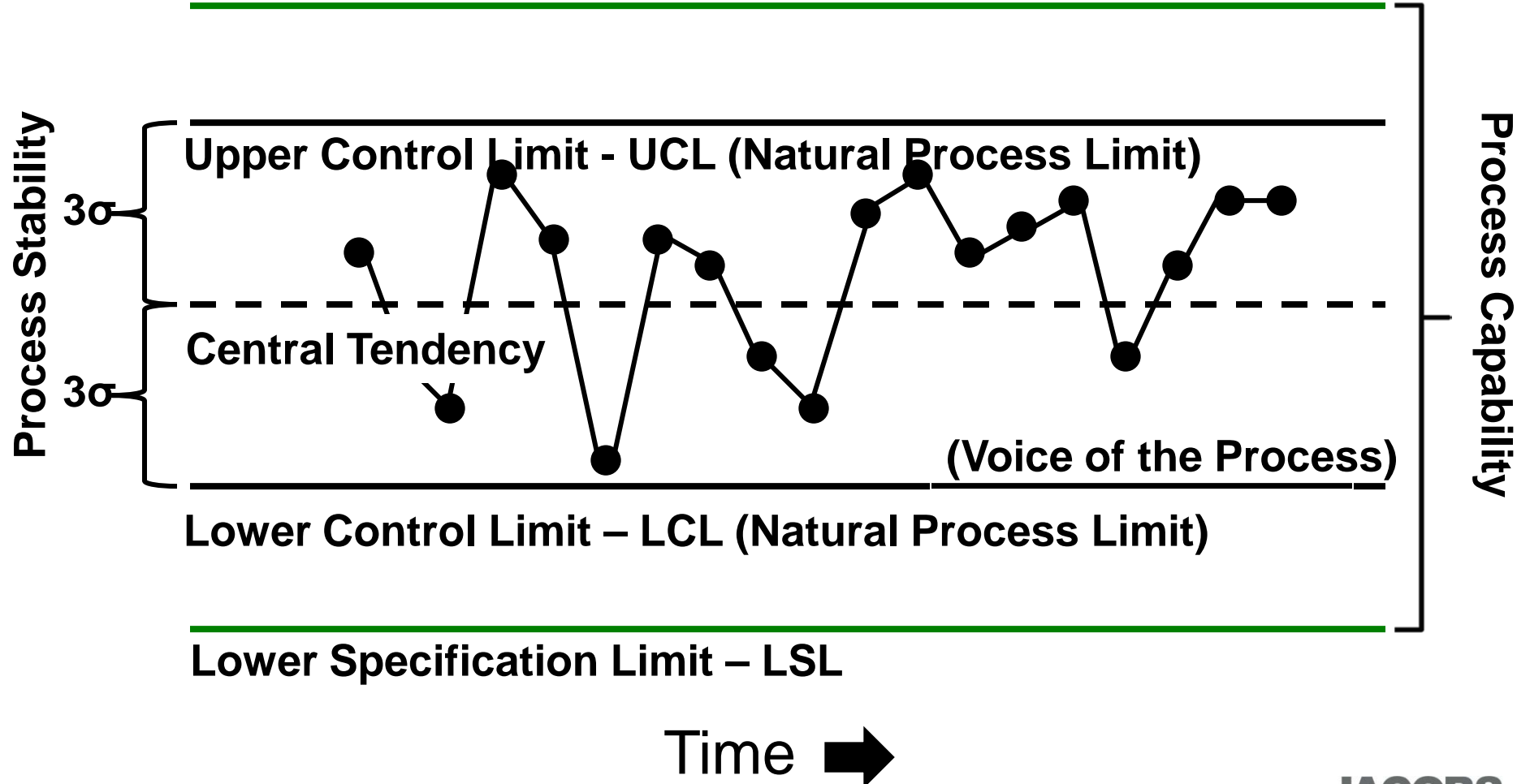*X-axis: Family of Lean/Agile Constructs*

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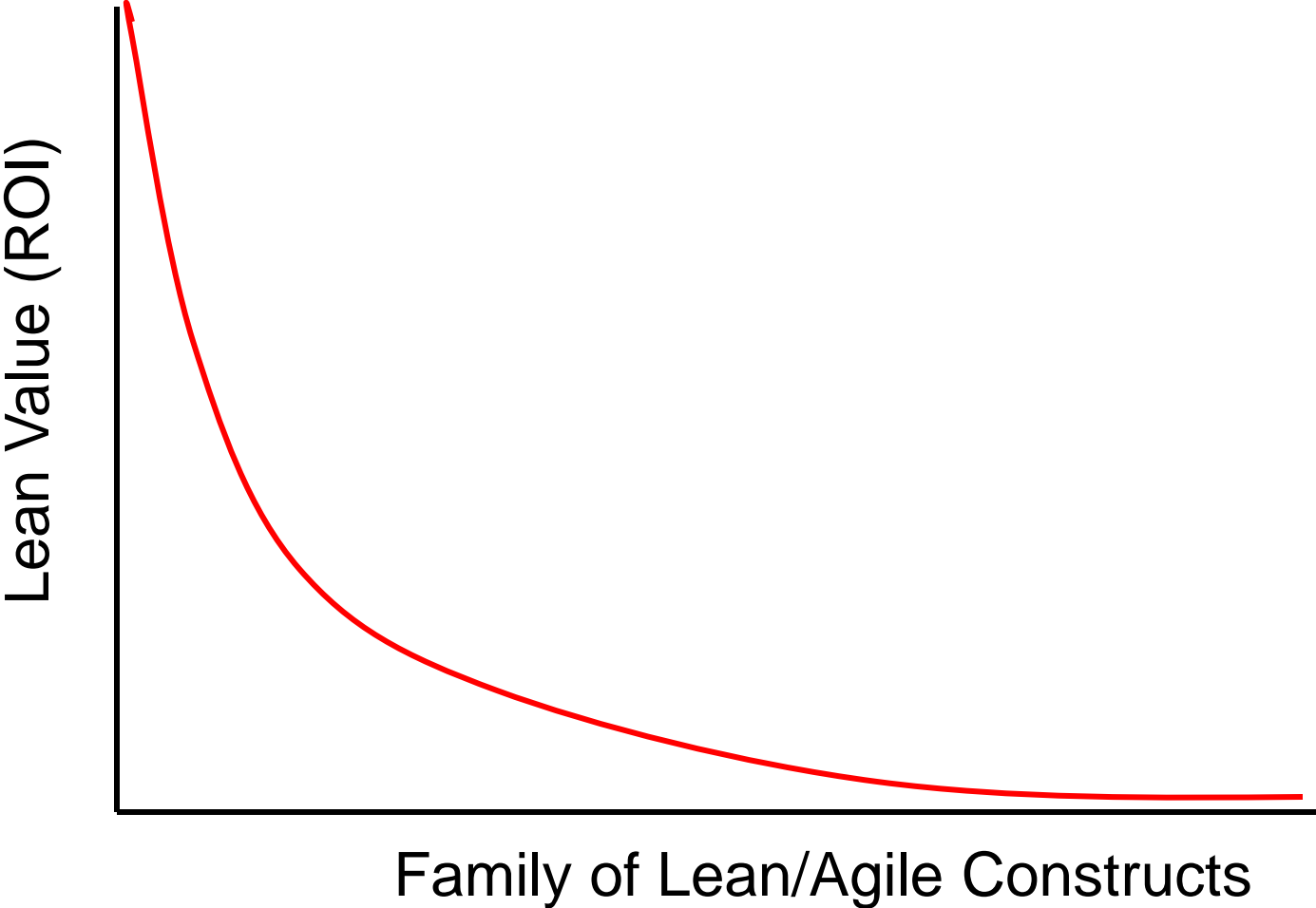
Six Sigma

- What is?
  - Statistical mechanisms for process control
    - Process variability
    - Central tendency
  - Some mechanisms:
    - Regression and correlation
    - Tests of Hypothesis
    - Analysis of variance
    - Statistical process control
    - Experimental design
    - Process performance modeling and optimization
- Value proposition:
  - Allows prediction of project performance
  - Leading vs. lagging indicators
  - High degree of process control (e.g. six sigma)
- Downside:
  - High cost
  - Extensive timelines (improved by lean)
- Integration with other approaches:
  - Fully integrable with CMMI
 - Energized by lean (shorter cycles/more data)

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Sample Process Control Chart

Upper Specification Limit - USL   (Voice of the Customer)

Upper Control Limit - UCL (Natural Process Limit)

Process Stability

3σ

Central Tendency

3σ

(Voice of the Process)

Lower Control Limit – LCL (Natural Process Limit)

Process Capability

Lower Specification Limit – LSL

Time ➡

Information Technology Infrastructure Library

- What is?
  - Best practices for IT service operations
  - Fair implementation guidance
  - ITSM life cycle
    - (Strategy/Design/Transition/Operation/Continuous Improvement)
- Value proposition:
  - Excellent set of IT- specific practices
  - Several useable ITSM processes
  - Personal knowledge certifications
  - ISO 20000 registration
  - Some guidance for setting objectives and strategy
- Downside:
  - Little support for "organization for improvement"
  - No framework for benchmarking performance improvements
- Integration with other approaches:
  - Works well with CMMI-SVC
  - Can be benchmarked with CMMI SCAMPI A (presentation Wednesday 10AM)
  - Orthogonal to Six Sigma
  - Organizational context improved with Lean Thinking

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Relative Contributions Fully Integrated Framework
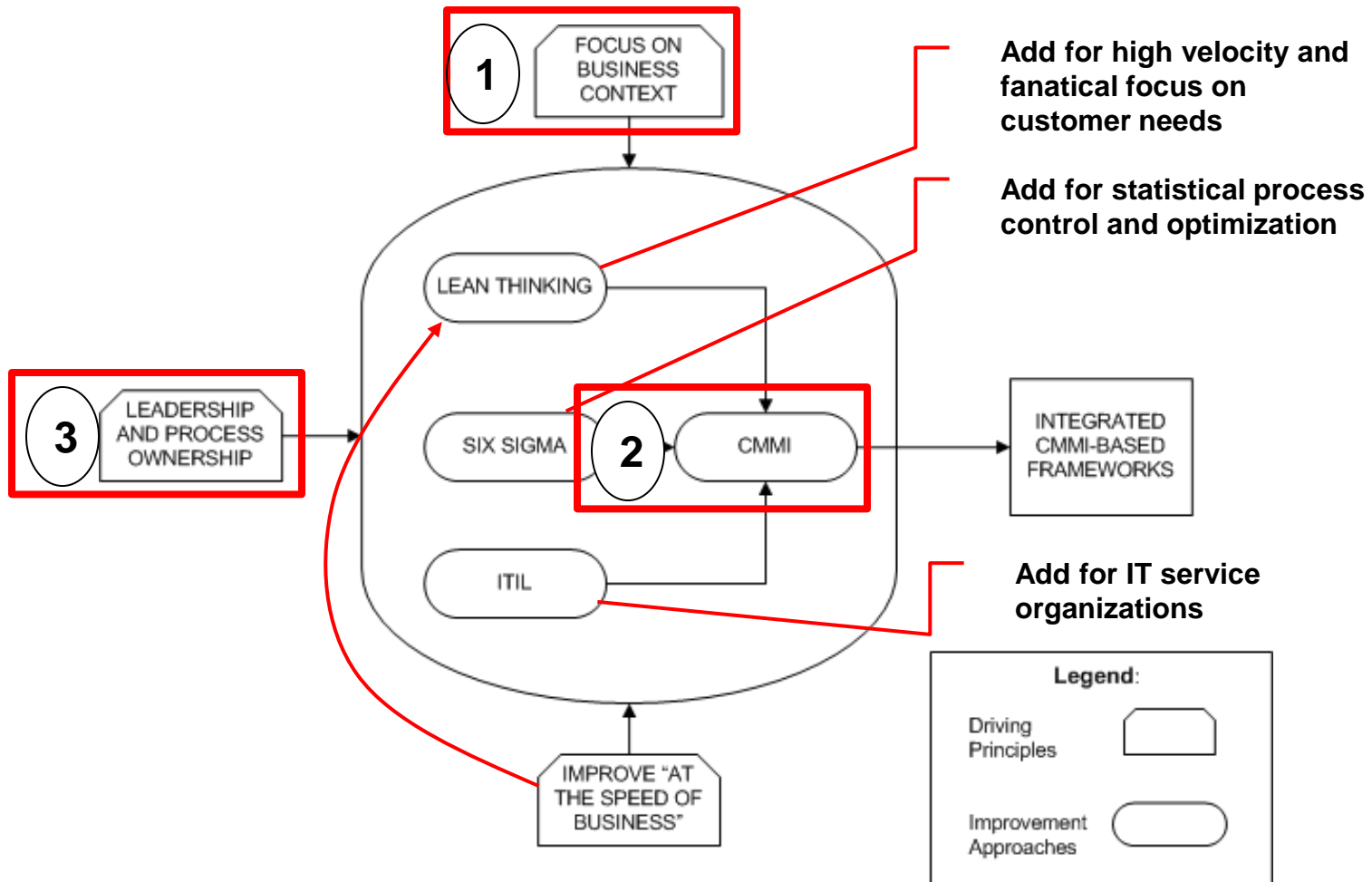## (CMMI-SVC Example)
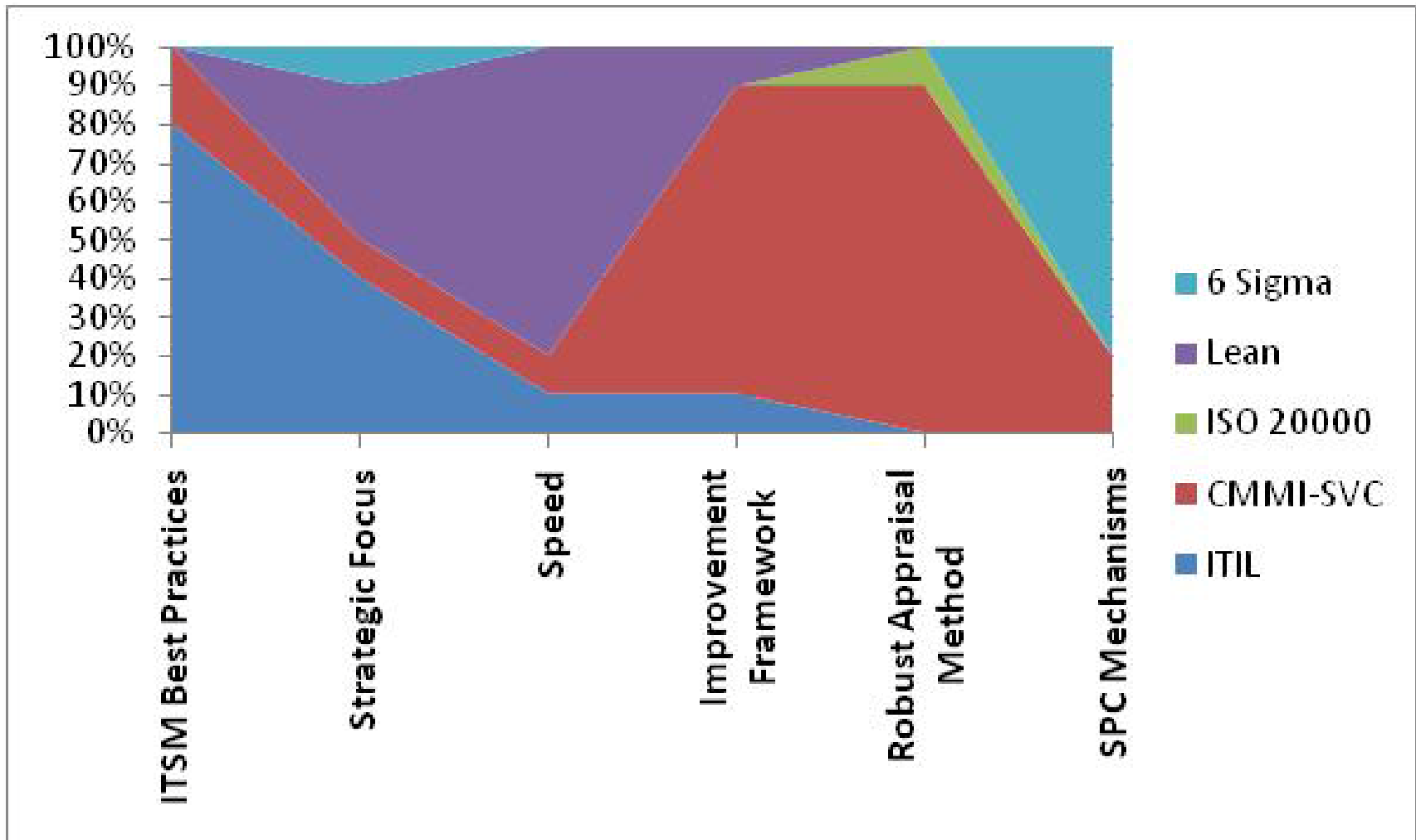
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Making the Framework Sing

- Applying the Framework
- Driving principles
  - Focus on performance and quality objectives
  - Direct involvement of leadership
  - Process ownership
  - Improvement velocity
- Choosing the improvement approaches
- Tuning the Framework – some examples

Applying the Framework

Add for high velocity and fanatical focus on customer needs

Add for statistical process control and optimization

Add for IT service organizations

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Example 1: Small SW Development Organization

- Performance Objectives:
  - Negotiated schedules are estimated and met with no more than a 10% variance
  - Financial costs within a 10% variance
  - Customer survey scores of 90+% satisfaction
  - Delivered product and development iterations meet or exceed committed requirements 100% of instances
  - Customer sign off occurring within 1 week after project completion
- 11 Months to achieve goals and ML3
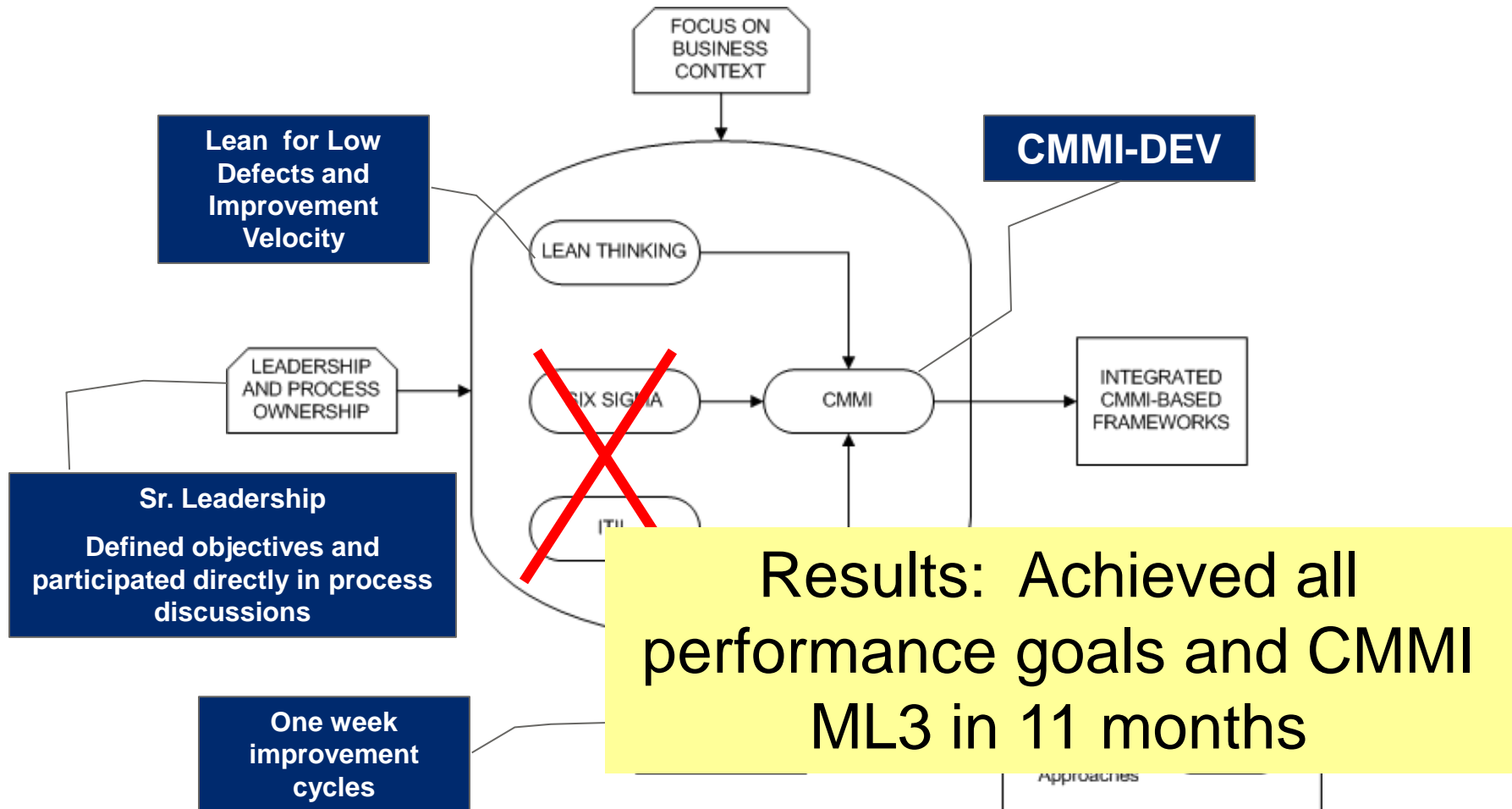
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- Performance Objectives:
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FOCUS ON BUSINESS CONTEXT

Lean for Low Defects and Improvement Velocity

CMMI-DEV

LEAN THINKING

LEADERSHIP AND PROCESS OWNERSHIP

SIX SIGMA

CMMI

INTEGRATED CMMI-BASED FRAMEWORKS

Sr. Leadership

Defined objectives and participated directly in process discussions

One week improvement cycles

Approaches

Results: Achieved all performance goals and CMMI ML3 in 11 months
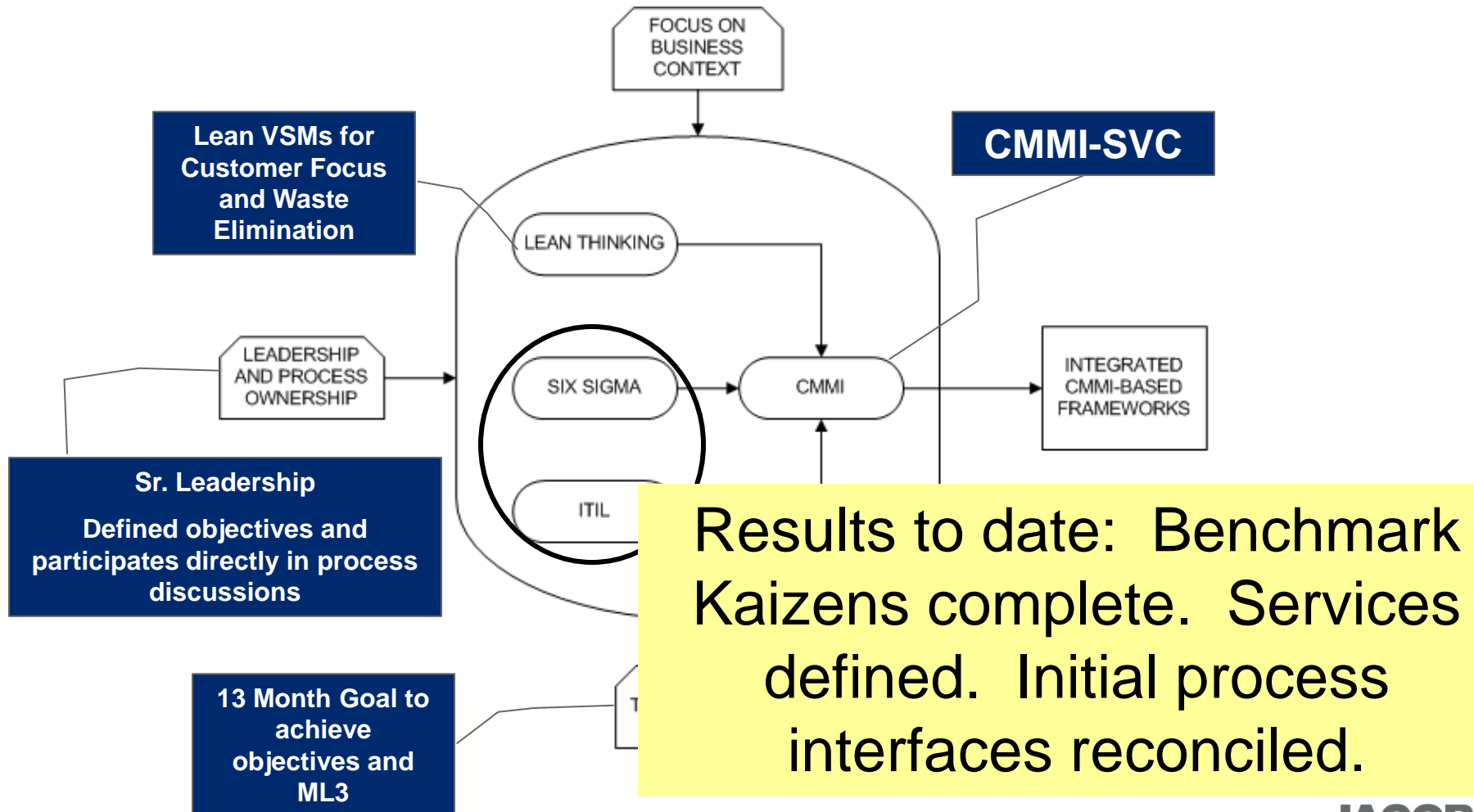
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Example 2: IT Service Organization

- Large IT commercial organization
- Internal (Lean) CMMI-DEV ML3 software dev. organization
- Performance Objectives:
  - Mistake-free processes and services
  - Seamless flow between business departments
  - Single ownership of services
  - Delivered services meet or exceed Service Level Agreement (SLA) 100% of instances
  - Develop credible proof of delivery capability and continuous improvement

- Performance Objectives:
  - Mistake-free processes and services
  - Seamless flow between business departments
  - Continuous improvement of defined services
  - Single entry of information/data
  - Single ownership of services
  - Delivered services meet or exceed Service Level Agreement (SLA) 100% of instances
  - Develop credible proof of delivery capability and continuous improvement

FOCUS ON BUSINESS CONTEXT

Lean VSMs for Customer Focus and Waste Elimination

CMMI-SVC

LEAN THINKING

LEADERSHIP AND PROCESS OWNERSHIP

SIX SIGMA

CMMI

INTEGRATED CMMI-BASED FRAMEWORKS

ITIL

Sr. Leadership

Defined objectives and participates directly in process discussions

13 Month Goal to achieve objectives and ML3

Results to date: Benchmark Kaizens complete. Services defined. Initial process interfaces reconciled.

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- See article in Jan/Feb 2010 issue of Crosstalk

- To discuss further, contact me at:

  jeff.dutton@jacobs.com

QUESTIONS?

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