Leveraging Lean Six Sigma and CMMI® to Improve Program Performance

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Purpose

• Within Lockheed Martin, Lean Six Sigma and CMMI® approaches to continuous improvement are being integrated to address the goal of perfect program performance
• Identify where LM business units have used Lean Six Sigma and CMMI® in a complimentary manner to improve program and business performance
• Offer ideas how your business can integrate Lean Six Sigma and CMMI®
Defining the Terms

• **CMMI®** - Framework for managing processes and integrating activities across an organization

• **Lean** - Set of principles for efficient and effective processes, based on the Toyota Production System

• **LM21** - Lockheed Martin’s approach for combining Lean and Six Sigma: “Lean Processes Operating at Six Sigma Capability”

• **Six Sigma** - Problem-solving approach that addresses specific improvement needs through improvement projects and statistical methods
Common Characteristics

- Focus on eliminating defects and rework
- Reliance on measurement and statistical methods
- Emphasis on understanding and reducing variability
## Differences Create Opportunities

<table>
<thead>
<tr>
<th>Lean Six Sigma</th>
<th>CMMI®</th>
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<tr>
<td>Å Assumes processes have been identified and defined</td>
<td>Å Focus on defining management and technical processes early</td>
</tr>
<tr>
<td>Å Doesn’t distinguish organizational standard and project processes</td>
<td>Å Organizational process definition used to capture best practices</td>
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<td>Å Emphasis on training to motivate and communicate skills</td>
<td>Å Emphasis on infrastructure to ensure key processes addressed</td>
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<tr>
<td>Å Reliance on statistical methods to manage performance</td>
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<tr>
<td>Å Focus on learning from internal experience and data</td>
<td>Å Additional mechanisms leverage external technology</td>
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<tr>
<td>Å Prioritization of efforts based on business payoff</td>
<td>Å Link to strategic planning weak improved with V1.2</td>
</tr>
<tr>
<td>Å Certification of individual practitioners</td>
<td>Å Certification of assessors and organizations</td>
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Adapted from Card, *Integrating Lean, Six Sigma, and CMMI*
Opportunities for Synergy

- CMMI® provides a set of best practices for program management, systems and software engineering, and integrated product and process development
- CMMI® provides a measurement scale to benchmark organizations against each other
- CMMI® defines requirements for measurement and statistical analysis; Lean Six Sigma provides tools to implement
- Lean Six Sigma provides a process for performing process and product improvement activities
- Lean Six Sigma provides a strong mission/business orientation to process improvement
Lean Six Sigma Helps CMMI® Implementation

- Provides a tactical engine for continuous improvement from problem definition through implementation of change
- Supports rational decision-making through credible measurement of benefit
- Helps solve specific problems and improve specific products or processes within the larger context of organizational process improvement
- Requires alignment with business drivers
- Garners effective sponsorship for change
Using LM21 and CMMI® Together

Within Lockheed Martin, LM21 is being used to support CMMI® based processes:
- Implement CMMI® Processes
- Improve CMMI® Processes
- Achieve CMMI® High Maturity
- Improve the Improvement Process
Use LM21 to Implement CMMI® Processes

By implementing a CMMI® process area or a group of process areas using LM21, the goal is a process that serves the mission and meets model requirements.

“Map the model to the process, not the process to the model”

Kaizen established PPQA processes on Program

Kaizen established Program ERB process
Use LM21 to Improve CMMI® Processes

• Use Lean principles to improve processes to improve processes and six sigma to measure results

• Drive process improvements where quantitative measures show actions are needed

• When LM21 is used with CMMI®, programs see meaningful, measurable performance improvements

• 24% improvement in defection detection

• 45% reduction in cost to fix defects
Use LM21 Critical Skills to Achieve CMMI® High Maturity

CMMI® High Maturity is about applying appropriate statistical and other quantitative methods to understand and predict process performance.

LM21 provides the statistical analysis tools to implement - *Not* limited to use in high maturity organizations.

LM21 Critical Thinking used to understand process performance and reduce variation.
Use LM21 to Improve the Improvement Process

- LM21 can be used to identify the highest priority problems to support improvement project selection and portfolio management
  - Program Excellence Plans (PEPs) link strategic and tactical goals with process improvement initiatives
- Optimize improvement program execution
- Common repository provides a record of the results of all improvement activities

Project to lean improvement process
Integrate Improvement Initiatives

- LM21 and CMMI® integrated into an organization-wide governance model that provides a standard for program execution
- Establish a set of standard processes that incorporates all the features of the initiatives of choice

Process flow for using LM21 for causal analysis
Conclusions

- Within Lockheed Martin, Lean Six Sigma and CMMI® have demonstrated their value in the pursuit of perfect program performance.
- Lean Six Sigma brings focus on business needs and measurable improvement to CMMI® based improvement.
- For those responsible for rolling out process improvement efforts - design your implementation so Lean Six Sigma and CMMI® interoperate.
References
