Linking Project Performance 
to CMMI Process Capability 
through Lean Measurements

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Lessons Learned from m

- 5 organizations: Jacobs and Government
- About 75 projects
- Over three years
What we will discuss

• Perspectives of project performance
• Relationships of performance to process capability
  • Project level
  • Organizational level
• How Lean can help
• Conclusions and summary
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A Sample Project Performance Measure…

Normalized Per-Project Profitability (constant dollars)
What may be causing the variability?

Variability iné.

Project complexity?
Requirements stability?

Why not just focus on improving project performance?

Normalized Per - Project Profitability (constant dollars)
How mature/capable is the process?

How may the process be performing?

This graph implies a positive correlation between process capability and project performance.

Can we tell if process capability is CAUSING an effect on project performance?

Institutionalization?
Degrees of Coupling….
(between process capability and project performance)

- Completely unknown and uninvestigated relationship between process capability and project performance
- Multi-variate correlation of process capability and project performance
  - Heuristic at ML 2 and 3
    - (perhaps gross correlations to CL or ML)
  - Statistical at ML 4 and 5
    - (performance/quality attribute to subprocess capability)
- Causal analysis of project performance based in part on process capability
- Process capability DRIVEN by project performance goals
  - and enabled by ORGANIZATIONAL process-performance
So what are the basic relationships between process capability and project performance?

Â Projects can perform well without mature or capable processes
  ï Just not consistently

Â Capable processes are NO guarantee of project performance
  ï (even at ML 4 and 5)

Â To **guarantee** that our process improvement effort will result in improvements in project performance
  ï We are led to what conclusion?

**PROCESS IMPROVEMENT SHOULD BE TIGHTLY COUPLED TO PROJECT PERFORMANCE**

Project Performance Needs **Should drive** Process Improvement
How can Lean help?

Link project performance to process capability early?

Å Lean (Kaizen) rapid improvement events
  ï Are based on initial and target performance measures
  ï Are driven by the customer view
    Å (i.e. reflect business needs from the project’s perspective)
  ï Include project workflow performance measures
    Å Current state
    Å Goal state
    Å Ideal state

Å Examples of Lean project performance measures:
  ï Product cycle time
  ï Defect profiles (life cycle phase/time in system)
  ï Degree of synchronization
  ï Waste eliminated (dollars/life cycle)
Integrated SCAMPI Appraisals

Å Alternative practices
   • "Leaned" specific or generic practices are supported
   • May end up with a greater number of SPs
     Å (e.g. Project Planning)

Å Process-performance (High Maturity)
   • Process-performance baselines
   • Process-performance models
   • Could well include lean process-performance

Å Non-model findings
   • Lean attributes
     Å Consistency of iterations
     Å Waste identified
Dynamic Relationships

**Project Performance**
- Start with project performance goals
- Add organizational Performance goals
- Quantify project performance

**Process Capability**
- Map to project processes that can help
- Map to organizational process
- Use process models and baselines to support obj.
- Innovate and optimize across the organization

Lean

ML2
ML3
ML4
ML5
Soé how do we do this?

• ML 2 Managed
  - Project process capability begins to mature
  - **Instill (Lean) project performance goals early – may be out of process scope**

• ML 3 Defined
  - Organizational processes are defined (Lean as well?)
  - Relationship between organizational and project processes is first established
  - **Ensure the organization enables lean projects to perform all in scope**

• ML 4 Quantitatively Managed
  - Statistically stable processes
  - Process-performance baselines and models are established at organizational level (OPP)
  - Process-performance is managed at project level (QPM)
  - **Statistical control of processes and coupling to process-performance**

• ML 5 Optimizing
  - Process-performance is continually improved
  - **Optimizing boundless opportunities to improve process-performance**
What does Lean/CMMI integration do for us?

- Puts process capability and project performance in the same space/time continuum (at ML1)
  - Forces us to pay attention to both at the same time
  - Before process-performance considerations at CL/ML 4 and 5

- Allows us to relate process capability and project performance BEFORE CL/ML 4 and 5
  - Which means we deal with process architecture issues much earlier
  - Which means our processes perform better earlier (heuristically)
  - Which means we pay attention to project PERFORMANCE from Day 1 (as a driver?...)
Summary

Å Lean supports integration of project performance considerations at ML1, ML2, and ML3

- Focus and priorities for process improvement effort
- Includes product quality as well as project performance

Å Lean provides direction for process-performance models and baselines

- Lean organization will help projects perform better
- Lean organization will help projects produce higher quality products
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