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# Linking Project Performance to CMMI Process Capability through Lean Measurements

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**JACOBS**

# Lessons Learned from

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- ” 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

# yada yadaõ .

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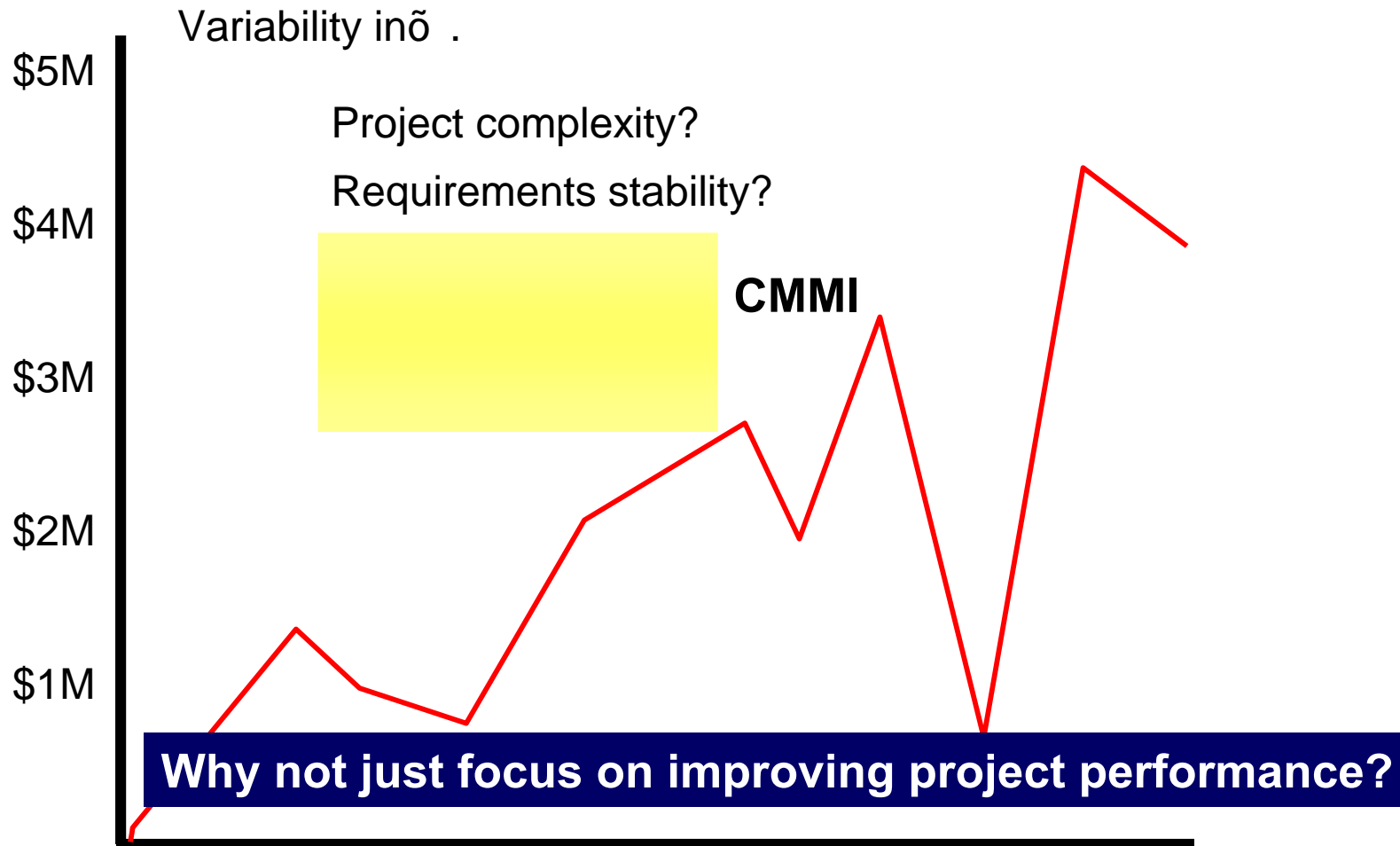
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## A Sample Project Performance Measure...



**Normalized Per - Project Profitability (constant dollars)**

# What may be causing the variability?



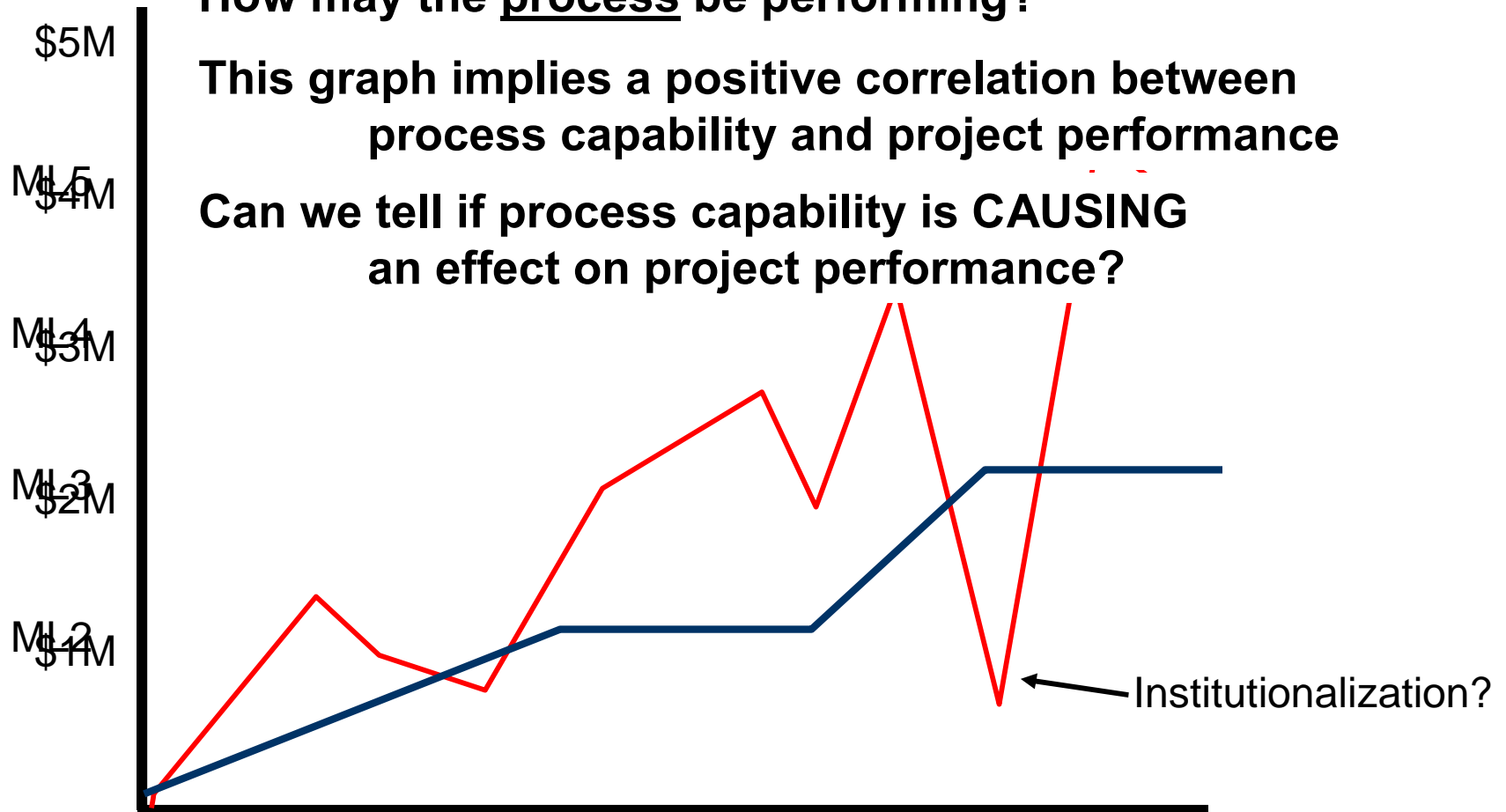
Normalized Per - Project Profitability (constant dollars)

# 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?



Normalized Per Project Profitability (constant dollars)

# 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 sub process 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



(added)

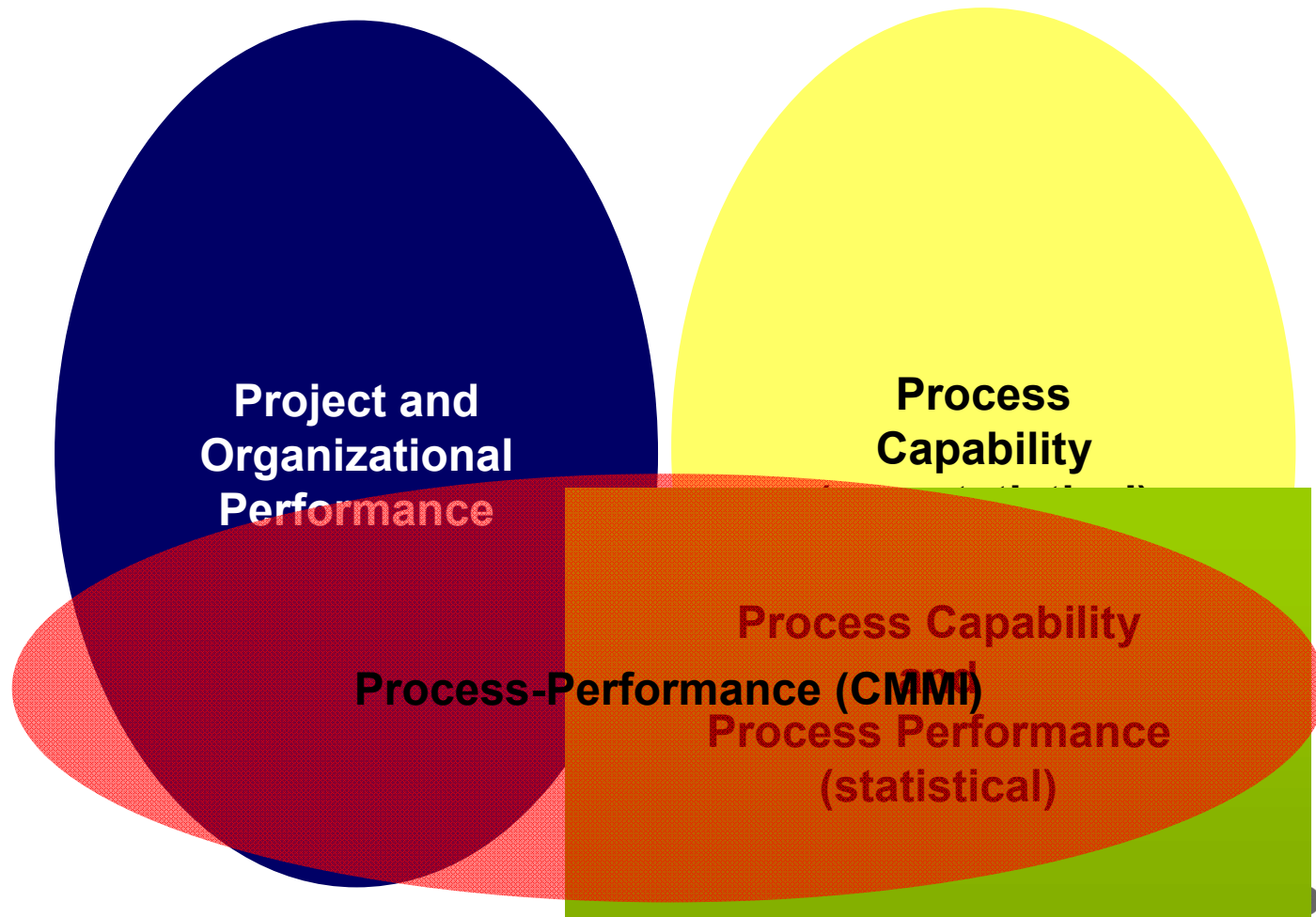
ML 1

ML 2

ML 3

ML 4

ML 5



## Relationships Between Process & Performance

**So what are the basic relationships between process capability and project performance?**

- “ Projects can perform well without mature or capable processes
  - . Just not consistently
- “ Capable processes are NO guarantee of project performance
  - . (even at ML 4 and 5)
- “ To guarantee that our process improvement effort will result in improvements in project performance  
  - . 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?

### “ Lean (Kaizen) rapid improvement events

- . Are based on initial and target performance measures
- . Are driven by the customer view
  - “ (i.e. reflect business needs from the project's perspective)
- . Include project workflow performance measures
  - “ Current state
  - “ Goal state
  - “ Ideal state



Map to process capability?

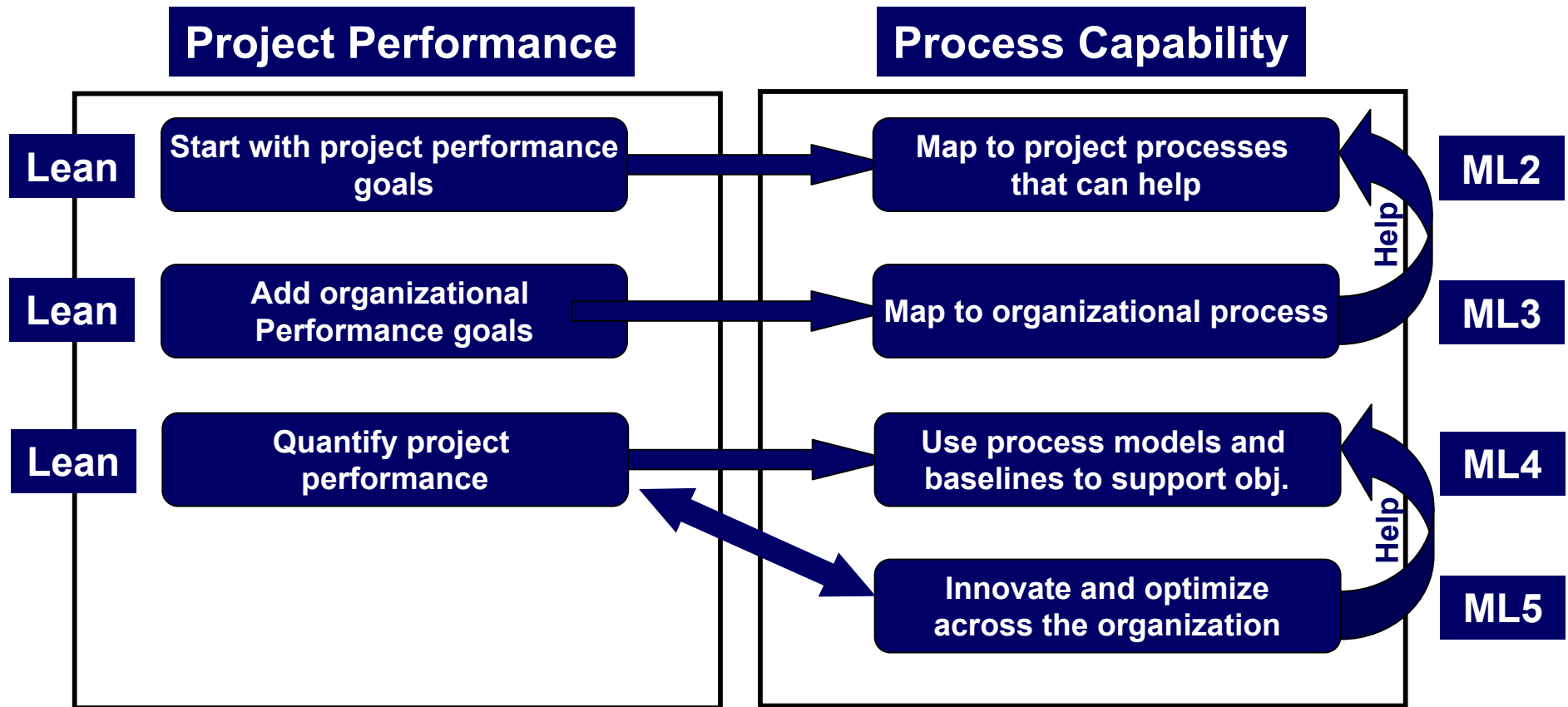
### “ Examples of Lean project performance measures:

- |   |                     |
|---|---------------------|
| . Product cycle time                                | Process Performance |
| . Defect profiles (life cycle phase/time in system) | Product Performance |
| . Degree of synchronization                         | Process Performance |
| . Waste eliminated (dollars/life cycle)             | Process Performance |

# Integrated SCAMPI Appraisals

- “ Alternative practices
  - . %leaned+specific or generic practices are supported
  - . May end up with a greater number of SPs
    - ” (e.g. Project Planning)
- “ Process-performance (High Maturity)
  - . Process-performance baselines
  - . Process-performance models
  - . Could well include lean process-performance
- “ Non-model findings
  - . Lean attributes
    - ” Consistency of iterations
    - ” Waste identified

# Dynamic Relationships



# Soñ 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

- “ 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
- “ 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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