

How Does High Maturity Benefit the Customer?

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Background

- Until recently, Level 3 has been considered an industry standard
- Now, several organizations have achieved high maturity and are touting its benefits
- Others are considering it, but little has been published about the costs and value of high maturity

What are the differences between Level 3 and Level 5?
What are the advantages of a high maturity organization?



Agenda

- Outline CMMI requirements for Levels 4 and 5
- Discuss organizational benefits of Level 4/5 versus Level 3
- Discuss customer benefits of high maturity in terms of project performance
- Identify strategic actions needed to extract value from high maturity



CMMI Levels

Improving, addressing common causes of variation

Quantitatively managed, eliminating special causes of variation

Work proactively managed, organizational standard processes

Work planned and tracked (reactively managed)

Work performed, but in an ad hoc fashion

	Level	Process Areas
>	5 Optimizing	Causal Analysis and Resolution Organizational Innovation and Deployment
>	4 Quantitatively Managed	Quantitative Project Management Organizational Process Performance
	3 Defined	Requirements Development Technical Solution Product Integration Verification Validation Organizational Process Focus Organizational Process Definition Organizational Training Risk Management Integrated Project Management (for IPPD*) Integrated Teaming* Integrated Supplier Management** Decision Analysis and Resolution Organizational Environment for Integration*
	2 Managed	Requirements Management Project Planning Project Monitoring and Control Supplier Agreement Management Measurement and Analysis Process and Product Quality Assurance Configuration Management
	1 Performed	

The Project Manager's Dilemma at Level 3

I want to use the organization's standard process, but...

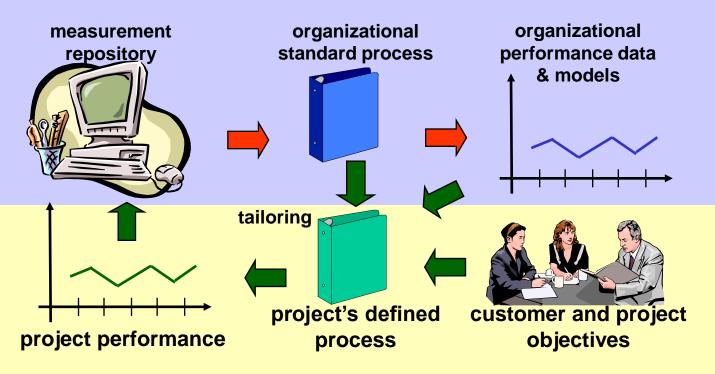
- ... Does it's performance and quality meet my customer's expectations?
- ... If not, how should I tailor the process?



CMMI Level 4

Organizational Process Performance

- Establishes a quantitative understanding of the performance of the organization's set of standard processes
- Provides process performance data, baselines, and models to quantitatively manage the organization's projects



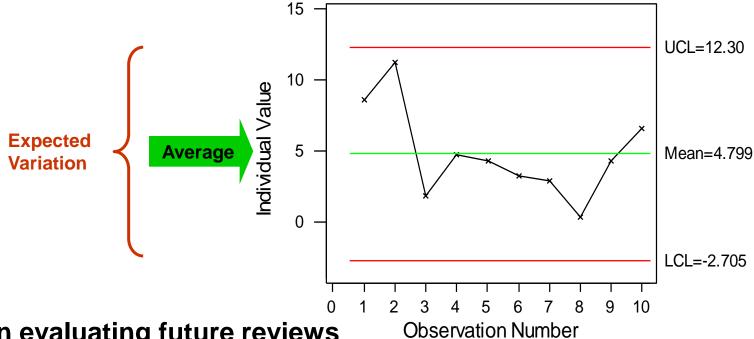
Quantitative Project Management

Quantitatively manage the project's defined process to achieve the project's established quality and process-performance objectives.

Understanding the Process

Managing by Variation

How many errors are typically found in reviewing an interface specification?



- Useful in evaluating future reviews
 - Was the review effective?
 - Was the process different?
 - Is the product different?



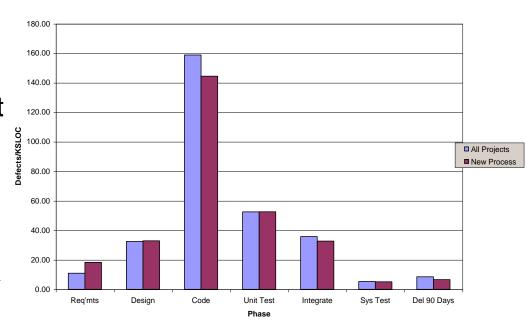


Typical Choices in Industry

Most customers care about:

- Delivered defects
- Cost and schedule
- So organizations try to predict:
 - Defects found throughout the lifecycle
 - Effectiveness of peer reviews, testing
 - Cost achieved/actual (Cost Performance Index – CPI)
 - Schedule achieved/actual (Schedule Performance Index – SPI)

Defect Detection Profile





What Can a Level 4 Organization Do?

- Determine whether processes are behaving consistently or have stable trends (i.e., are predictable)
- Identify processes where the performance is within natural bounds that are consistent across process implementation teams
- Establish criteria for identifying whether a process or process element should be statistically managed, and determine pertinent measures and analytic techniques to be used in such management
- Identify processes that show unusual (e.g., sporadic or unpredictable) behavior
- Identify any aspects of the processes that can be improved in the organization's set of standard processes
- Identify the implementation of a process which performs best



What Does Level 5 Add to the Organization?

Level 3

Organizational Process Focus

- Goals are qualitative (e.g., get better)
- The effects of the improvements are not estimated or measured

Level 5

Organizational Innovation & Deployment

- Goals are quantitative (e.g., reduce variation by X%, reduce mean by Y%)
- Incremental improvements eliminate special causes of variation
- Innovative improvements cause a major shift in process capability
- Potential improvements are analyzed to estimate costs and impacts (benefits)
- Improvements are piloted to ensure success
- Improvements are measured in terms of variation and mean

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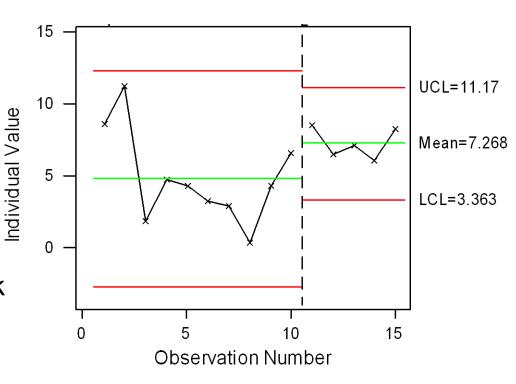
Peer Reviews – Improving the Process

Reduce the variation

- Train people on the process
- Create procedures/checklists
- Strengthen process audits

Increase the effectiveness (increase the mean)

- Train people
- Create checklists
- Reduce waste and re-work
- Replicate best practices from other projects



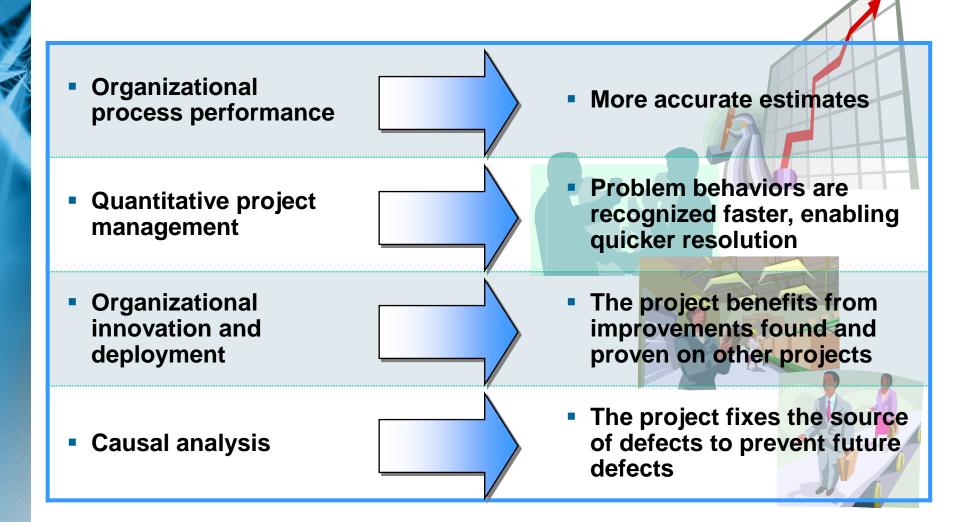


What Does Level 5 Add to the Project?

- Casual Analysis & Resolution
 - Identify and analyze causes of defects and other problems
 - Take specific actions to remove the causes
- The project can then take actions to prevent the occurrence of those types of defects and problems in the future
- Many projects implement Causal Analysis & Resolution at Level 4
 - Identify and eliminate special cause variations to stabilize the process



How Does Level 4 & 5 Benefit the Customer?



Better Products and Services Produced Faster And Cheaper

Lessons Learned

Based on 17 Northrop Grumman CMMI Level 5 organizations

- Six Sigma is an enabler for higher maturity
 - Focus on data, measurement systems, process improvement
 - Tying improvements to business goals
 - Tools and methods support the Level 4/5 analysis tasks
- Level 3 metrics, measurement processes, and goal setting are generally inadequate for Levels 4 and 5
 - Better definitions of the measures
 - Lower level metrics of lower level subprocesses
- Having all the tools at Level 5 gives you the insight to manage each project the way the customer needs it to be managed

