

1 Introduction

- Quality has different meanings.
- Car analogy: luxury car vs everyday car.
- Quality management planning:
 - Define quality standards
 - Document process, metrics, and tools.
 - Define how compliance to standards will be met.
- Quality Assurance:
 - Audit quality processes, policies, metrics and tools to ensure they are followed.
 - Ensure quality processes have right impact.
- Quality Control:
 - Collect data
 - Analyze
 - Make changes as needed
 - Ensure acceptance of project deliverables.
- Continuous Improvement
 - Identify lessons learned.
 - Revise and make improvements to quality plan.
- Cost of defect may include:
 - Time and effort spent investigating and diagnosing the defect.
 - Time and effort redesigning, developing, and re-testing the defect.
 - Time and effort if re-testing uncovers new defects.
 - Loss of good-will if defect is found by a customer.
- Quality Philosophies
 - Craftsmanship: masters, apprentices, journeyman
 - Scientific Management: breaking down the task into few steps can be performed with little training.
 - Total Quality Management:

- * Trained workers empowered to monitor and control quality of items they produced.
 - * Don't rely on mass inspections at end of project.
 - * Build quality into the process.
 - * Train and educate people, and let them take pride in their work.
 - * Eliminate slogans, work-quotas, and management by numbers.
 - * Quality is the responsibility of everyone in the organization.
- Quality Planning
 - * Identify customer
 - * Determine customer's needs
 - * Understand those needs
 - * Develop a product that meets customer's needs
 - * Ensure that the product meets the customer's needs as well as the organization.
- Quality Improvement
 - * Design the process that can produce the product.
 - * Optimize that process
- Quality Control
 - * Provide evidence that the process can produce the product.
 - * Operationalize the process
- Capability Maturity Model (CMM)
 - * Developed in 1986 by Software Engineering Institute (SEI)
 - * Recommended processes specific to software development.
 - * Process: A set of activities used by people to develop a product.
 - * Process capability: expected result that can be achieved by following a process.
 - * Process performance: actual results that are achieved by following a particular process.
 - * Process maturity: The extent to which a particular process is explicitly and consistently defined, managed, measured, controlled, and effectively used throughout the organization.
 - * 5 levels of maturity:
 - Level1: Initial: project process is ad-hoc and immature.
 - Level2: Repetable: basic policies, processes, and control of project management are in place. Project schedules/budgets are more realistic.

- Level3: Defined: Engineering and management processes are documented and standardized throughout the organization. A group oversees that the standards are followed.
 - Level4: Managed: quantitative metrics for measuring and accessing productivity and quality are established for both products and processes.
 - Level5: Optimizing; the whole organization of focused on continuous process improvement.
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- Focus on customer satisfaction
 - Prevention, not inspection.
 - Improve the process to improve the product.
 - Quality is everyone's responsibility
 - Fact-based management