

TOM GILB & KAI GILB



'Lean' **Quality Assurance**



by Gilb

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Main Take-away Points

Quality Assurance is far more than 'test', and it can be far more cost-effective

'Quality' is far more than 'bugs'

You probably have a lot to learn, if you want real competitive quality

Begin:

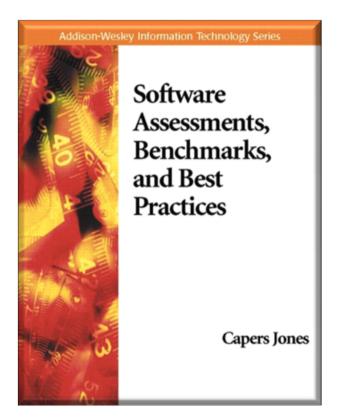
Quality Assurance is far more than 'test'

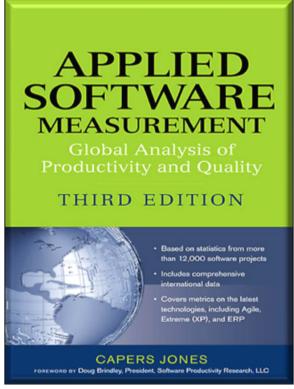
and it can be far more costeffective

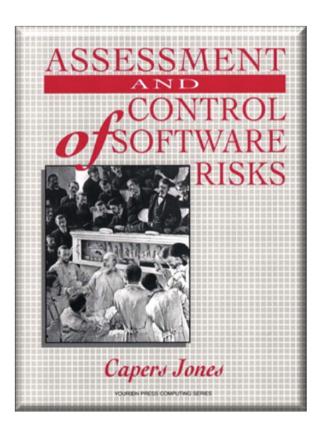


Inspection Effectiveness

Capers Jones







Regression test 1.2 15% to 30%

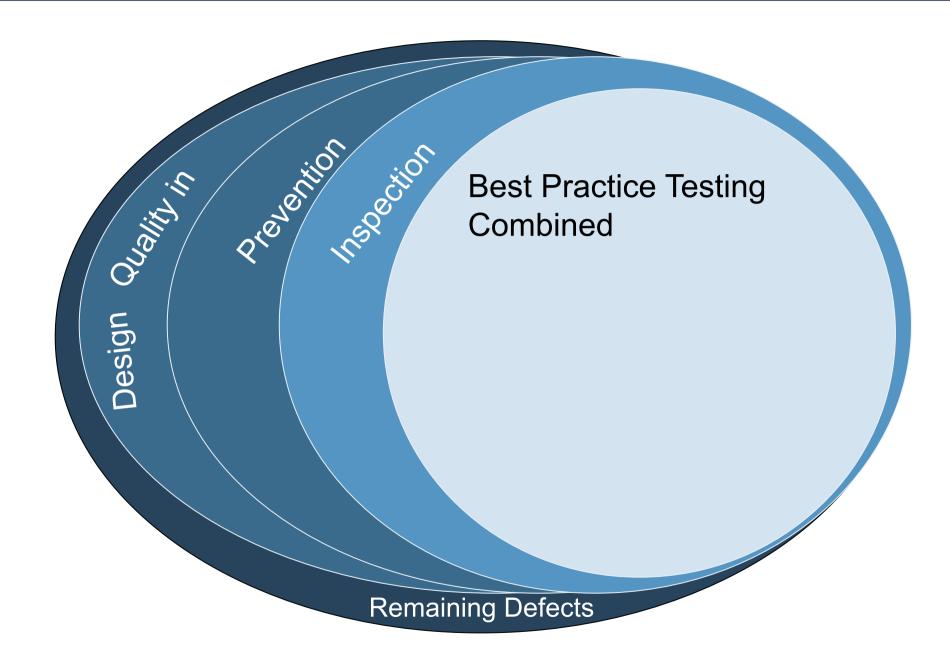
Integration test ? 25% to 40%

Unit test	15% to 50%
New function test	20% to 35%
Performance test	20% to 40%
System test	25% to 55%
Acceptance test (1 client)	25% to 35%
Low-volume Beta test (< 10 clients)	25% to 40%
High-volume Beta test (> 1000 clients)	60% to 85%

Inspections?

Informal design reviews
Formal design inspections
Informal code reviews
Formal code inspections

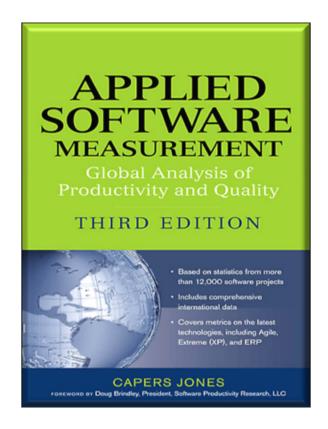
25% to 40% 45% to 65% 20% to 35% 45% to 70%



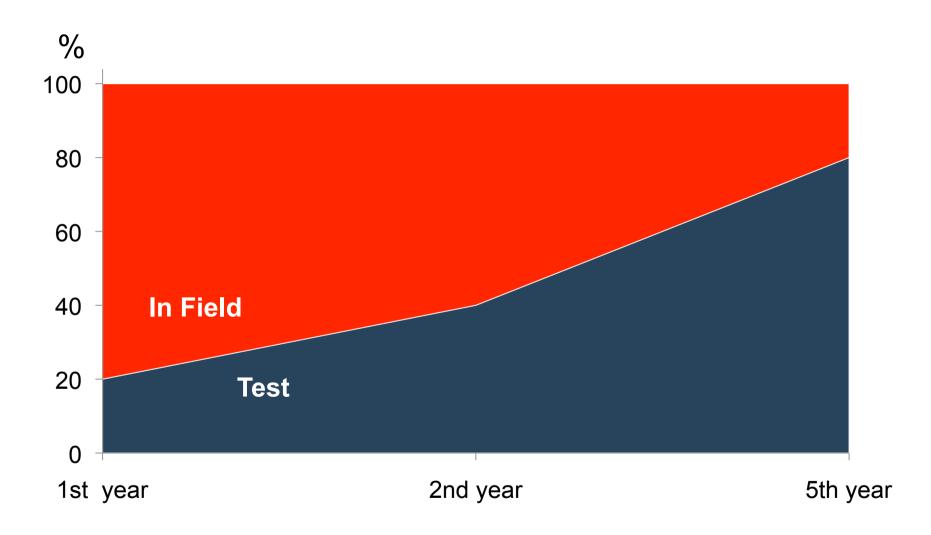
Little hope of 'zero defects'

"Between

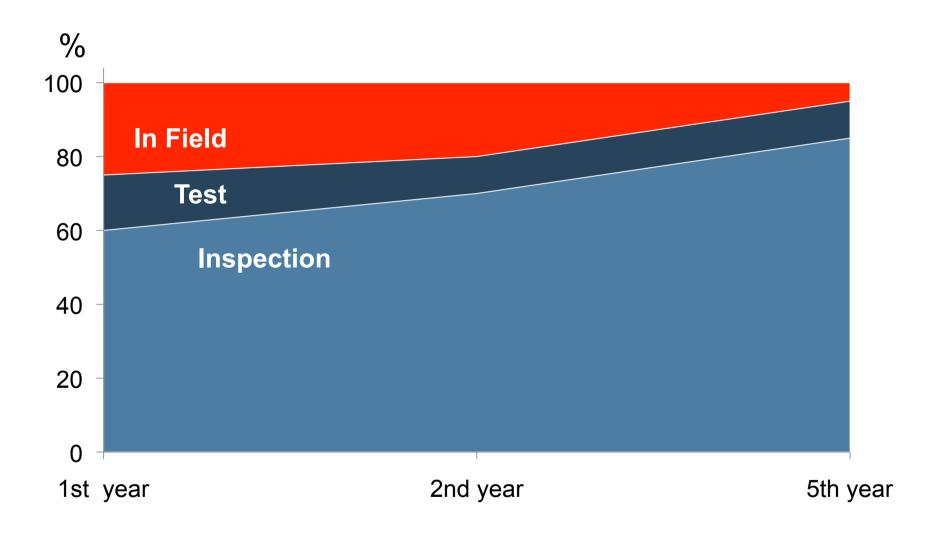
defect removal stages required to achieve removal effectiveness of



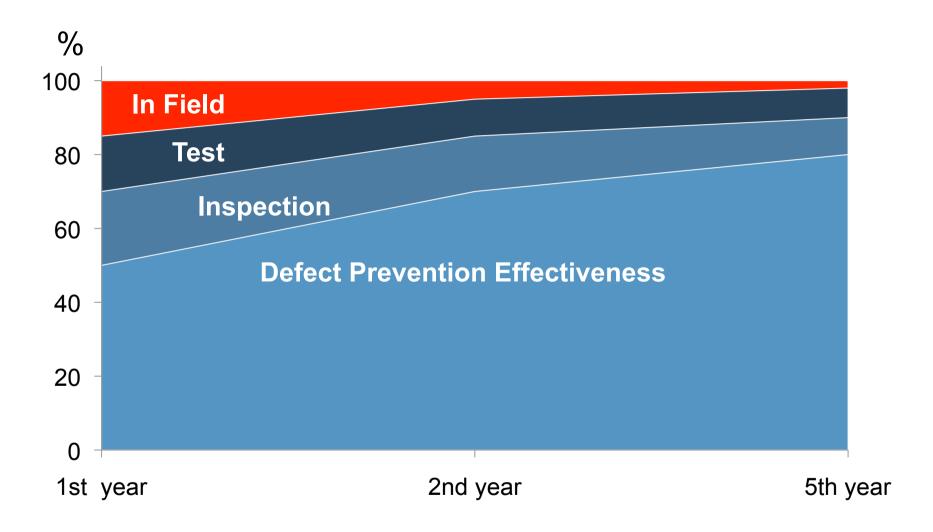
Testing Capability (C. Jones)



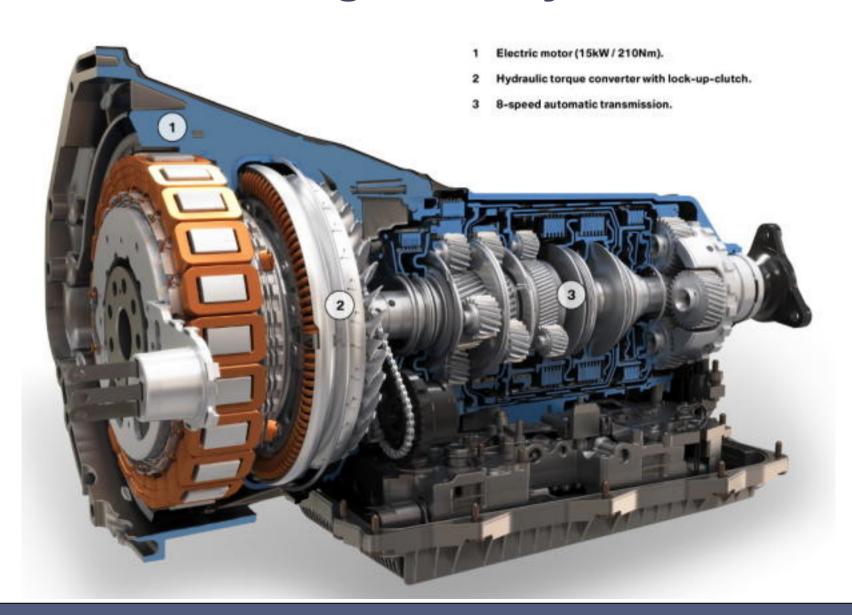
Defect Detection Capability (C. Jones)



IBM Defect Avoidance Experience



Design Quality In

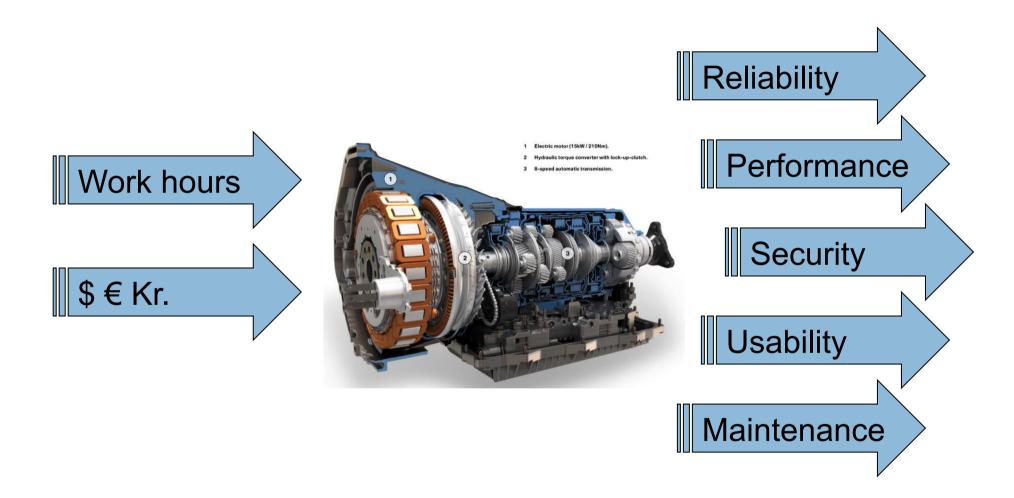


You don't get quality by testing it in





but by 'Engineering' Quality In



Setting Quality Goals

Usability.Learn

Scale: average time to Learn how to operate the computer, from .. to ..

> Status [today] 3 hours Goal [next year] 10 min.

Designing to meet Quality within Costs

Design Ideas



					Estimated Impact Estimated Impact		Estimated Impact		Estimated Impact			
	Prooduct Quality Requirements			Splash.Speaker		Splash.Keypad		Battery.Lock		Screen.Scratch		
	Past	Status	Tolerable	Goal	Units	%	Units	%	Units	%	Units	%
_	User-Friendliness.Learn			0	0%	0	0%	-1	7%	0	0%	
	55	20	25	5								
				by a year								
	Reliability			20	23%	25	29%	0	0%	10	12%	
	70	114	150	200								
				by a year								
	Style				0	0%	0	0%	0,5	0%	-0,5	0%
7	5	9,5	7	9								
				by a year								
	Sum of E	Benefits				23%		29%		7%		12%
Development Resources												
	Project-	-Budget			1000	1%	1700	2%	3000	3%	2000	2%
<u> </u>	0	4500	140000	1E+05								
							·					
	Sum of Development Resources				1%		2%		3%		2%	
	Benefits / Development Resources				22,21		16,33		2,12		5,5523	

End:

Quality Assurance is far more than 'test'

and, QA can be far more cost-effective

Start:

Quality is far more than 'bugs'



System Performance



Qualities are many and variable

Usability

- Learning
- Doing
- Error Rate

Adaptability

- Portability
- Enhancability
- Compatibility

Integrity

- Threat Type and Frequency
- Security Mitigation

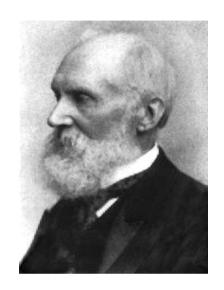
Availability

- Reliability
- Maintainability (fault fix speed)

Quantify the Quality to 'Assure' It

I often say that

when you can **measure**what you are speaking about,
and **express it in numbers**,
you know something about it;



but when you cannot measure it, when you cannot express it in numbers, your knowledge is of a meagre and unsatisfactory kind;

- Lord Kelvin, 1893

End:

Quality is far more than 'bugs'



Competitive Lean QA methods to Learn



Stakeholders Decide Qualities

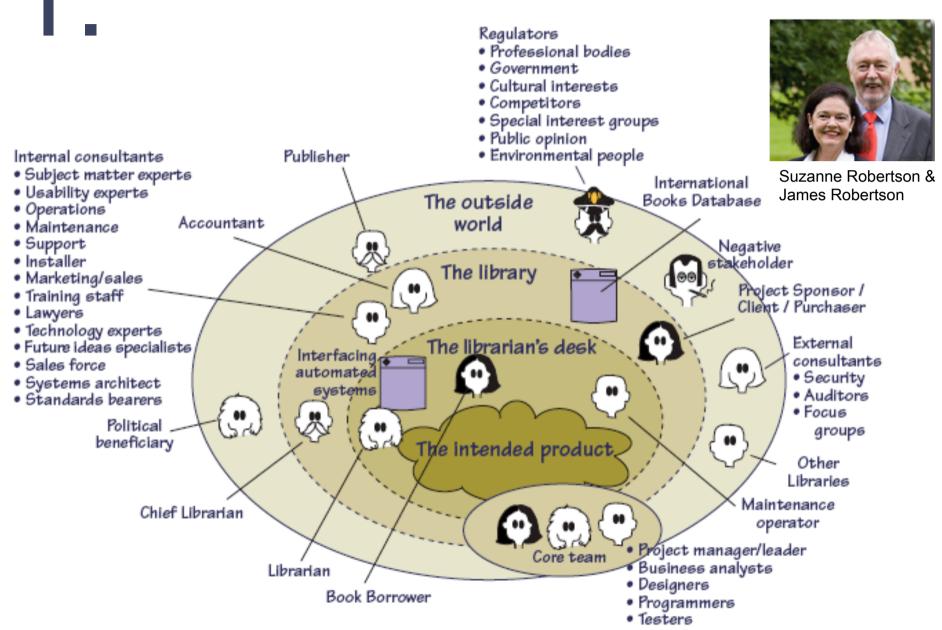


Figure 1: A Stakeholder Map for the Library Loans project

2.

Analysis

- Comparative Evaluation
- Deadline Completion Estimation
- · Data Collection & learning
- Research

Motivation

- · Contracting for results
- Paying Contractors for results
- Reward teams for results achieved
- Motivate Nerds towards Business

Quality Quantification

QC

- Quality Requirement Testing
- Design Inspections and Reviews

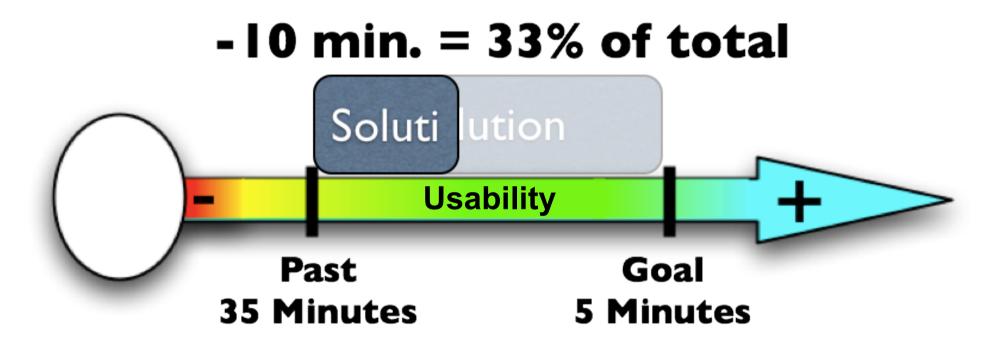
Requirements

- Communication of Primary Requirements
- Simplify requirements to Top Ten Critical Ones

Management

Project Management

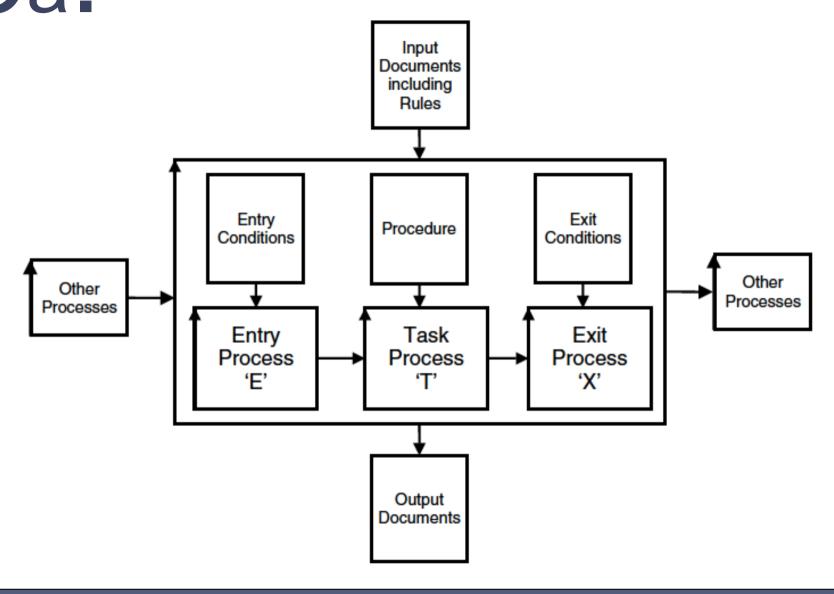
Assuring that Designs give Qualities



Measure Quality Levels in Specifications with Inspection

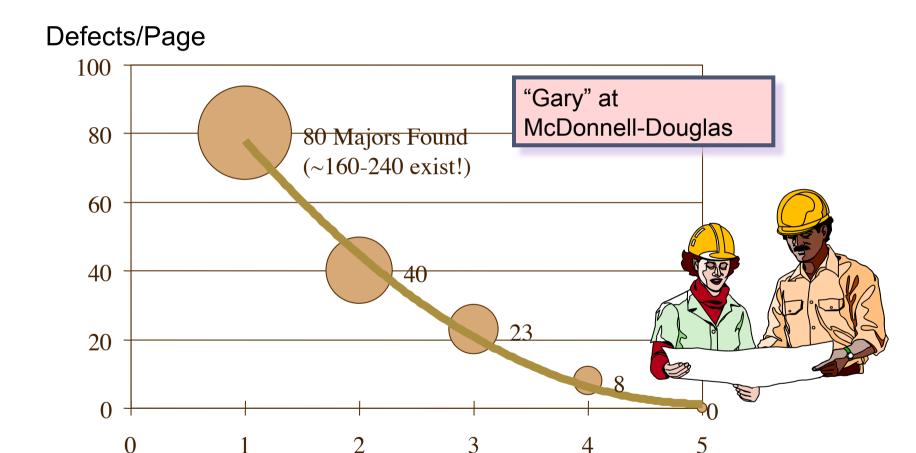


5a. Numeric Quality Gateways



5a.

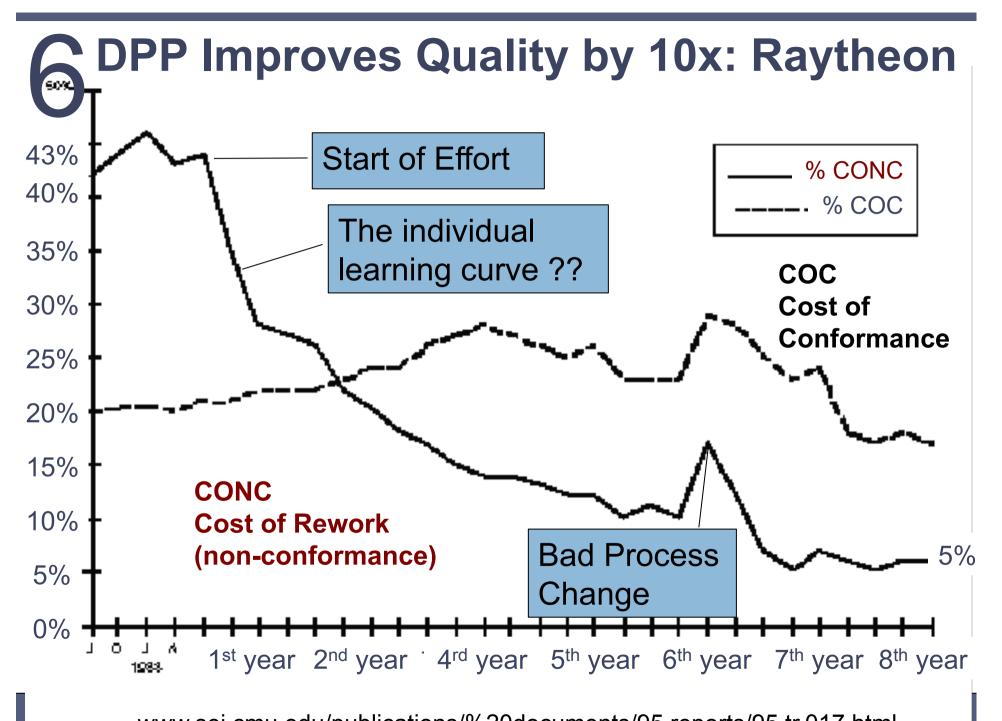
Numeric Quality Gateways Improve Quality of work



Inspections of Gary's Designs

February

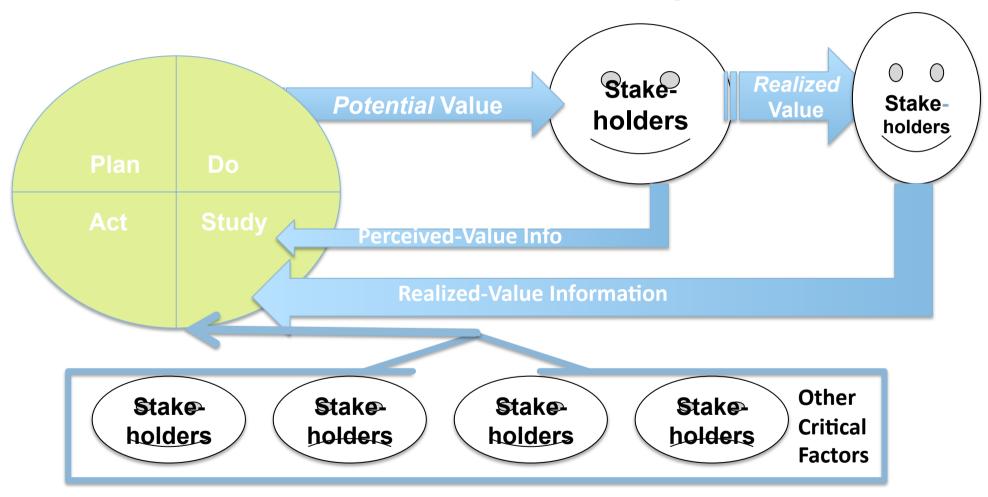
April



www.sei.cmu.edu/publications/%20documents/95.reports/95.tr.017.html

Figure 8: Cost of Quality Versus Time.

7 Frequent feedback and improvement assure quality



- 2 Kinds of Feedback from Stakeholders, when value increment is *really* exploited in practice after delivery.
- Combined with other information from the relevant environment. Like budget, deadline, technology, politics, laws, marketing changes.

Learn Stakeholders Measure Values Value Management Process Solutions Deliver Develop Decompose

Learn Stakeholders Measure Values Identify Stakeholders Who and what cares about the outcome of our project? Deliver **Solutions** Develop Decompose

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Learn Stakeholders Measure -Values Value Capturing Find & specify quantitatively Stakeholder Values, Product Qualities & Resource improvements. Deliver **Solutions** Develop Decompose

Learn Stakeholders Measure Values Solution **Prioritization** Find, Evaluate & Prioritize Solutions to satisfy Requirements. Deliver Solutions Develop

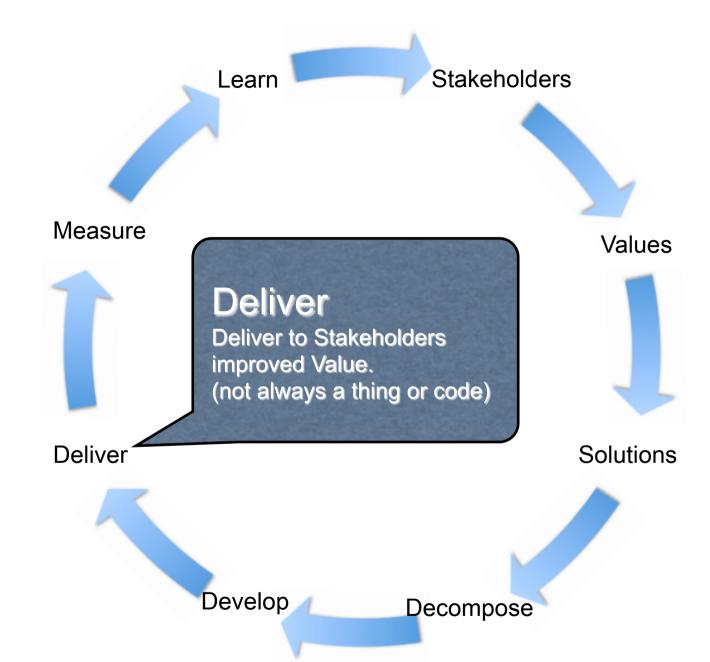
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Learn Stakeholders Measure Values **Evo Cycles** Decompose the winning Solutions down into smaller entities, then package them so they deliver maximum Value. Deliver **Solutions** Develop

Learn Stakeholders Measure Values Develop Develop the packages that deliver the Value. Deliver **Solutions**

Develop

7_b



Learn Stakeholders Measure-Values Measure Change Measure how much the Values changed. Deliver **Solutions** Develop Decompose

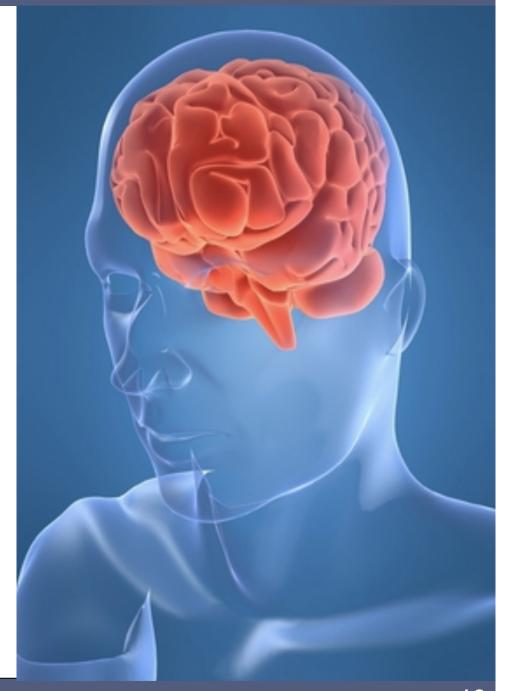
Learn Stakeholders Measure Values Learn & Change Learning is defined as a change in behavior. Deliver **Solutions**

Develop

Learn Stakeholders Measure Values Value Management Process Solutions Deliver Develop Decompose

End

Competitive Lean QA methods to Learn



What you can do immediately

- (1) Identify the 5 most critical qualities of your system.
- (2) Quantify the 5 qualities.
- (3) For each quality,
 - set a Current level
 - (2) and a Goal level

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You probably have a lot to learn, if you want real competitive quality



TOM GILB & KAI GILB



Thanks!

Questions: now, briefly

After lecture, all during the conference.

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The Lean Quality Assurance Methods

- Everything 'not adding value to the Customer' is considered to be <u>waste</u>.
 - This includes:
 - unnecessary code and functionality
 - Delay in the software development process
 - Unclear requirements
 - Bureaucracy
 - Slow internal communication
 - Amplify Learning
 - The learning process is sped up by usage of short iteration cycles each one coupled with refactoring and integration testing. Increasing feedback via short feedback sessions with Customers helps when determining the current phase of development and adjusting efforts for future improvements.
 - Decide as late as possible
 - Deliver as fast as possible
 - Empower the team
 - Build integrity in
 - separate components work well together as a whole with balance between flexibility, maintainability, efficiency, and responsiveness.
 - See the whole
 - "Think big, act small, fail fast; learn rapidly"