



The Role of Quality Assurers In Software Engineering's Fourth Wave

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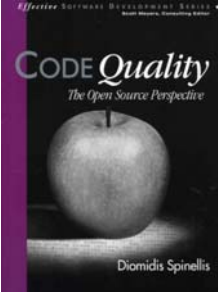


Rethinking Quality



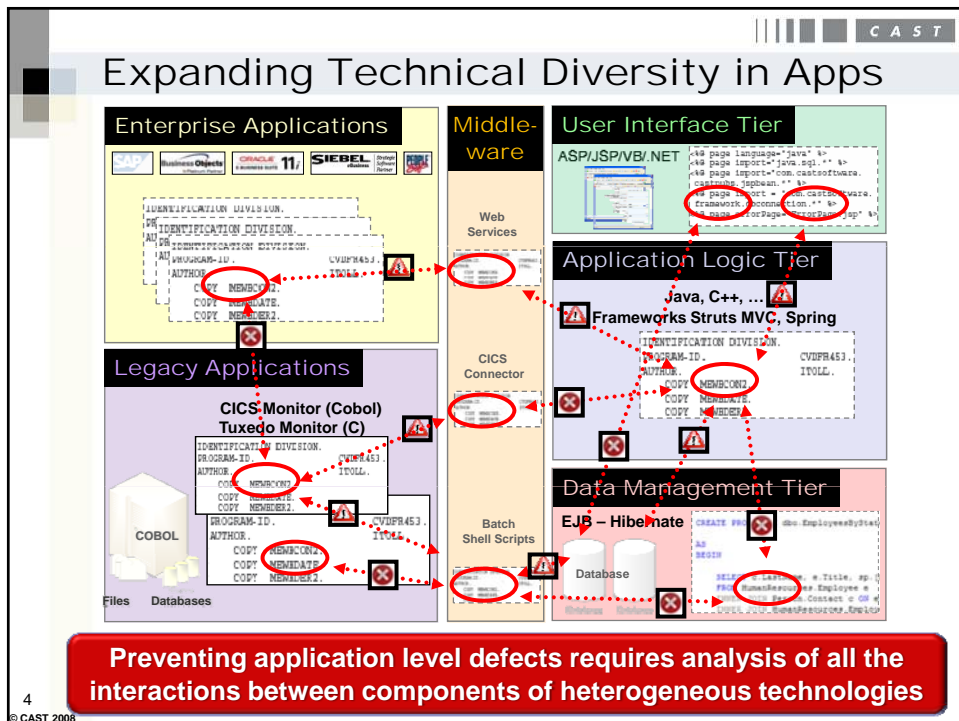
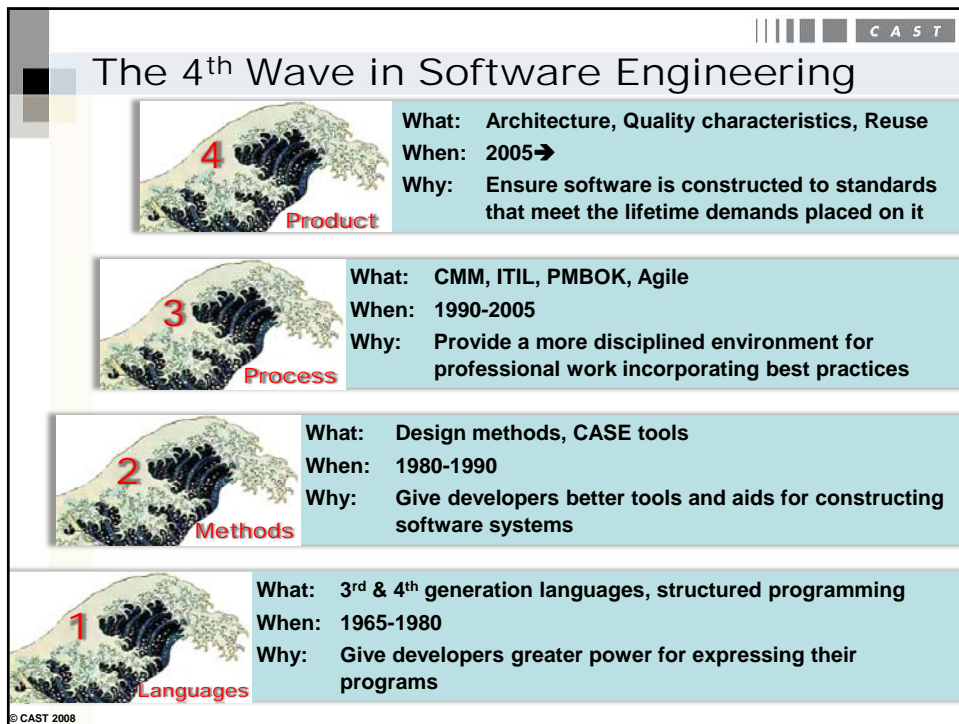
The degree to which a product meets its specified requirements

Problem—Customers struggle to state functional requirements. They do not understand non-functional requirements.



...a failure to satisfy a non-functional requirement can be critical, even catastrophic...non-functional requirements are sometimes difficult to verify. We cannot write a test case to verify a system's reliability...The ability to associate code to non-functional properties can be a powerful weapon in a software engineer's arsenal."

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Even Worse, Dispersed Development



What Is the Role for Quality Assurers?

Old answer: "I test and manage releases"
"I assure the process"

New answer: "I ensure dependable & secure
IT services to the business"
"I provide data to quantify risk,
the business value of quality,
and IT decisions"

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Ensure Dependability and Security

National Research Council Software for Dependable Systems



"As higher levels of assurance are demanded...testing cannot deliver the level of confidence required at a reasonable cost."

"The cost of preventing all failures will usually be prohibitively expensive, so a dependable system will not offer uniform levels of confidence across all functions."

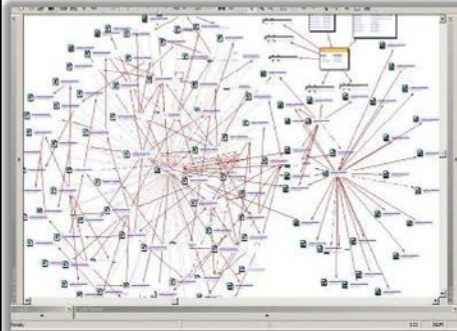
"The correctness of the code is rarely the weakest link."

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Jackson, D. (2009). *Communications of the ACM*, 52 (4)

Application Quality vs. Code Quality



Application Quality

Application quality measures how well the individual components work together to make up the overall business system

Code Quality

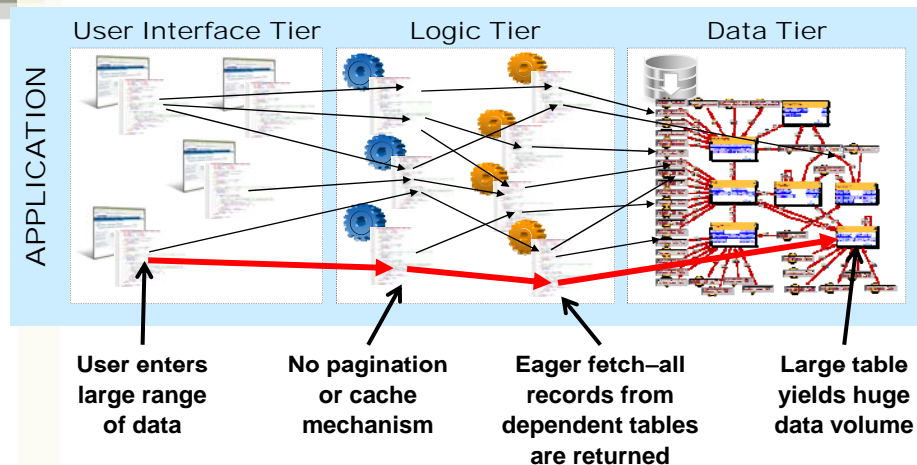
Code quality is the measure of individual components for compliance with standards and best practices in the context of a specific language

Good code quality \neq Good application quality

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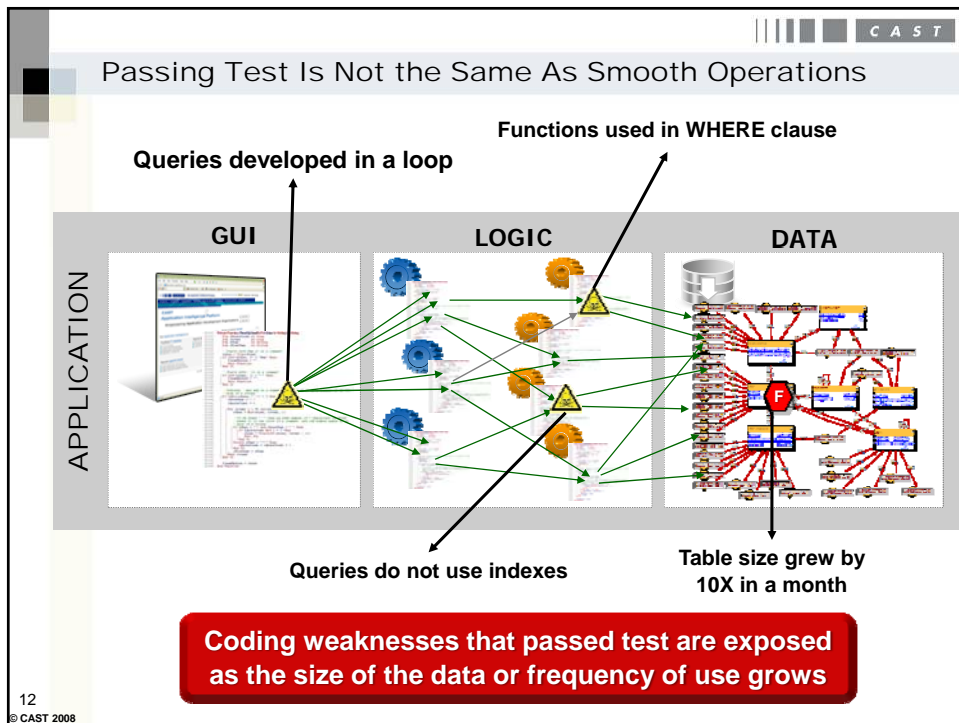
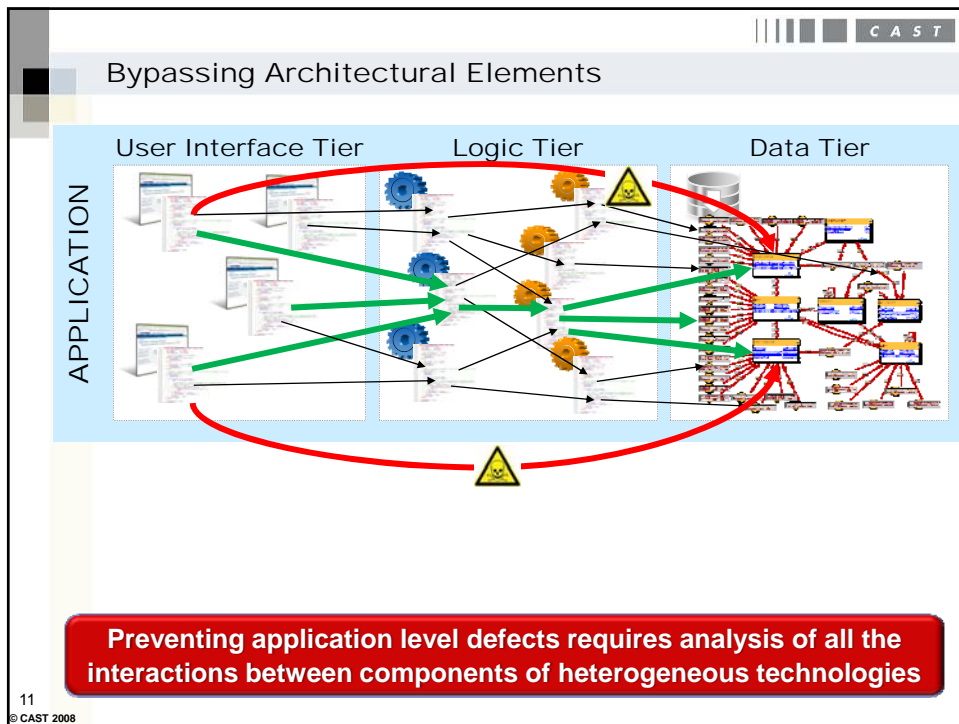
Failure to Provide Limits

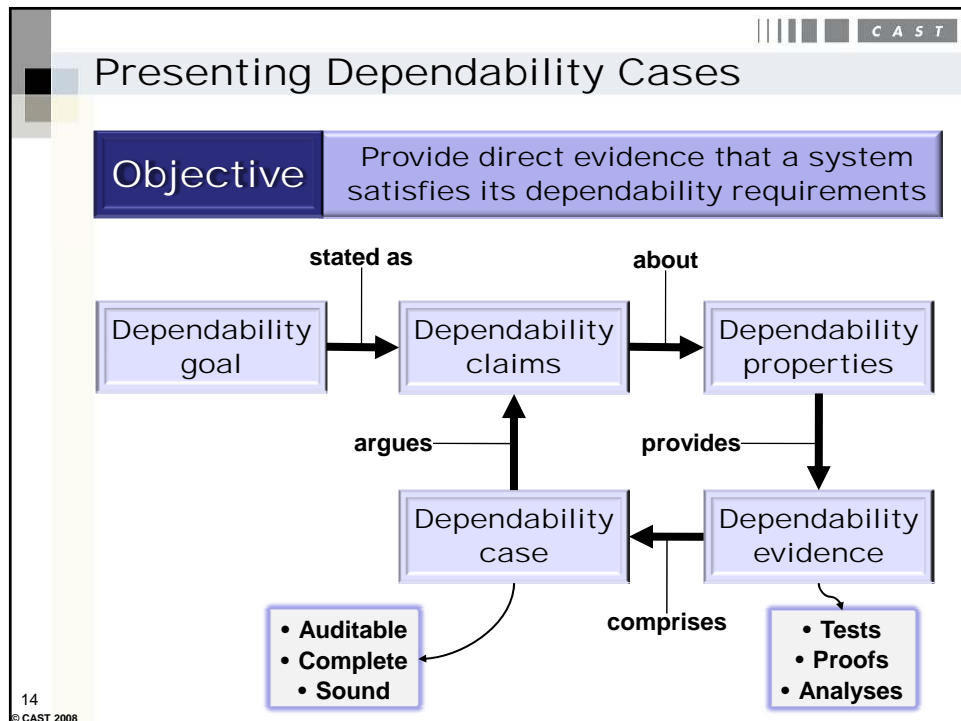
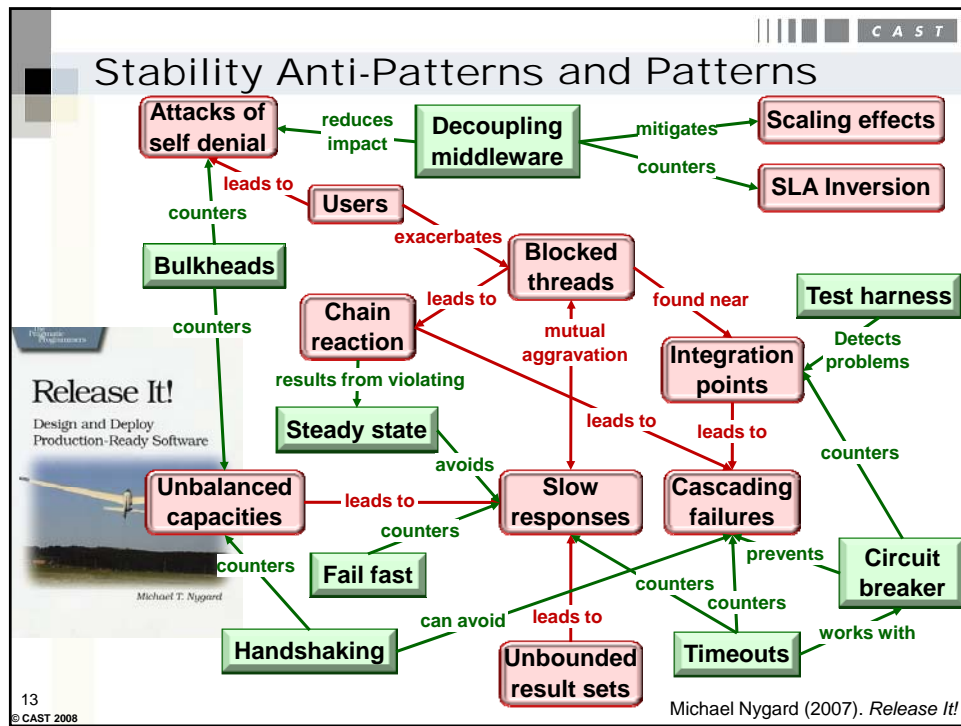


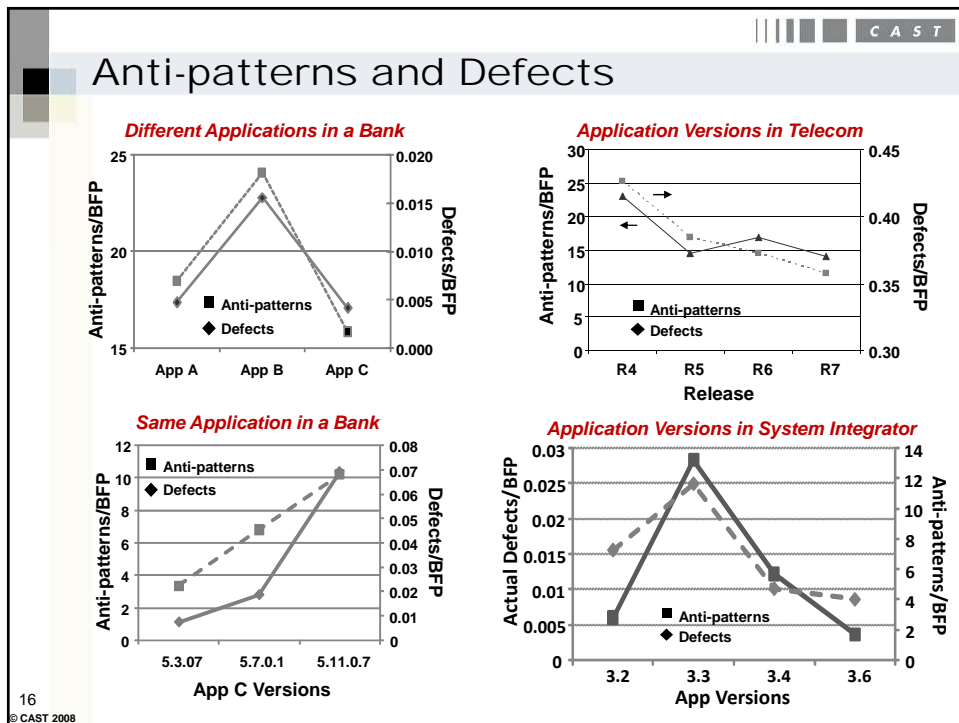
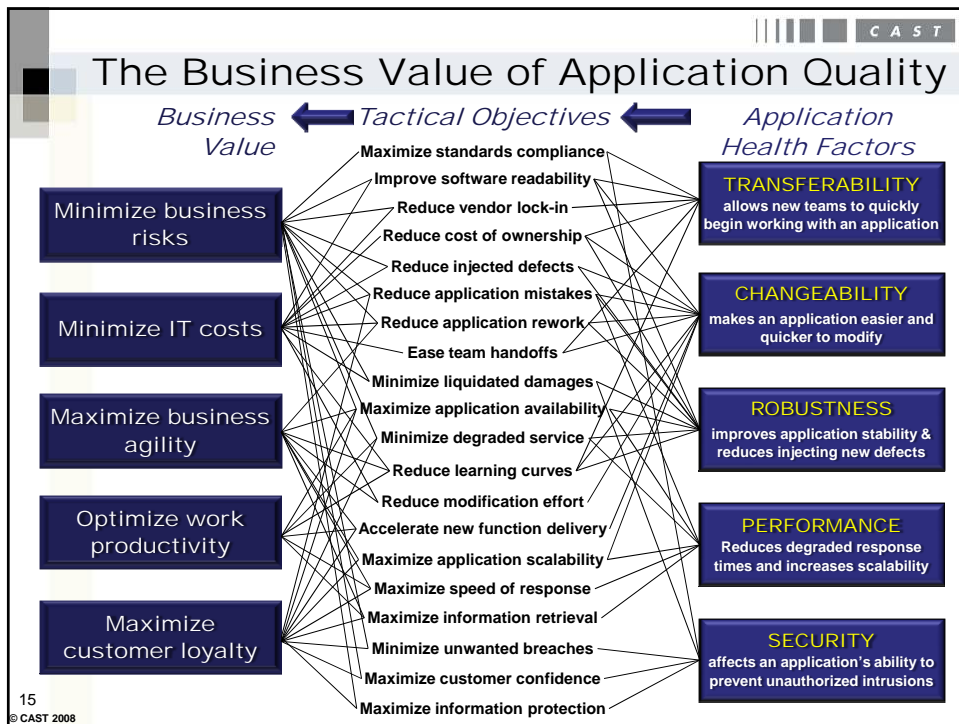
Big problems are often the result several interacting weaknesses in the code, none of which caused the problem by itself

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Allianz Austria's Maintainability Results

Business Need

- Reduce maintenance costs
- 700,000 LOC insurance mgt. system
- 10 million customers and processes
- 8 million claims a year

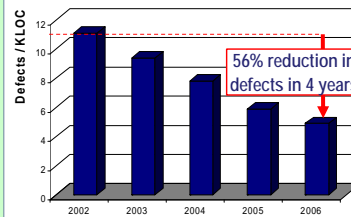


Solution

- ▲ Statically analyze application quality and stabilize maintainability score
- ▲ Provide reports to help development teams remediate problems faster

Business Benefit

- Maintainability stabilized despite 40% increase in code over 4 years
- Reduced delivery time by 60%
- Reduced costs 20% over 3 years
- 56% reduction in defects in 4 years

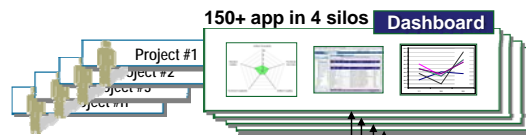


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Deutsche Telecom—Managing Suppliers

- T-Systems Active Billing & Multimedia Solutions
 - 120 billion call records and 1 billion invoices per year
 - SAP, Siebel, all front end apps that power www.tcom.de
- Internal quality analysis run one or two times per quarterly release
 - Penalties in contracts based on internal quality metrics
 - Aggregation of metrics into C-level management dashboards

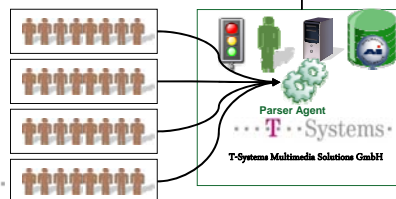


Team #1 • T-Systems •

Team #2 • Capgemini •

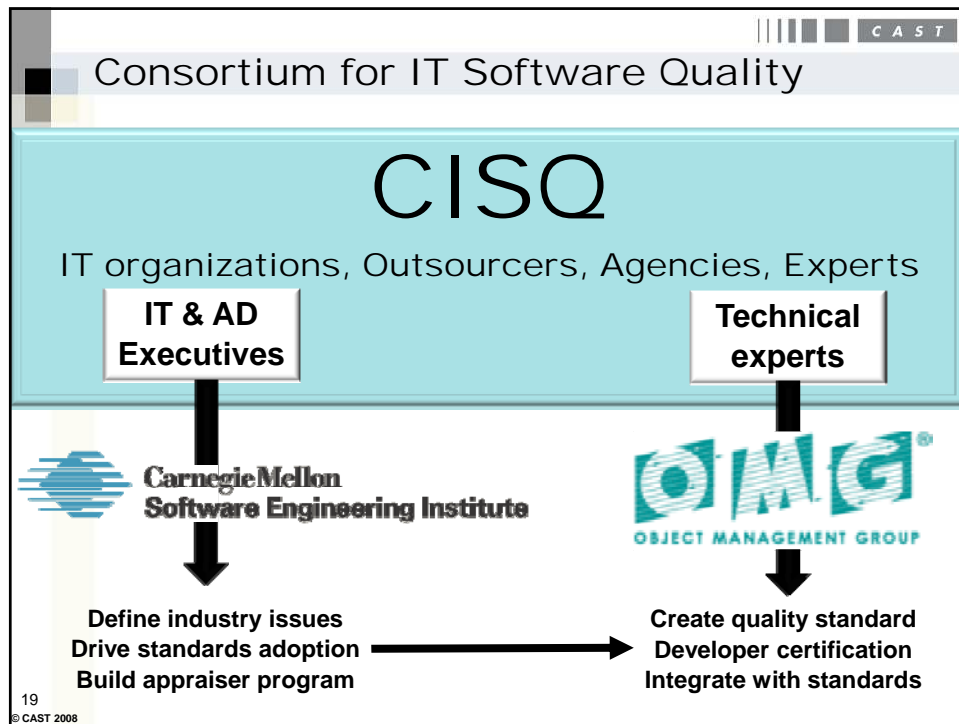
Team #3 • accenture •

Team #4 • T-Systems •



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What Does This Mean for QA Professionals

1. New opportunities as QA role upscales
2. Develop application analysis skills
3. Manage IT risk on behalf of business
4. Drive data collection and analysis

The closer to the business, the stabler the job!

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