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**The Value of Quality  
Assurance and Quality  
Control**

# **WHAT IS QUALITY?**

*“You get what you expected”*

# **WHAT IS QUALITY TO THE SOFTWARE DEVELOPMENT LIFECYCLE?**

**To the Business: Quality is  
Meeting Requirements**

**To the User: Quality is a  
User Friendly Product**

**WHY IS AN  
ACCEPTABLE LEVEL  
OF QUALITY  
IMPORTANT?**

**It is the only way to  
economically produce  
software in today's  
complex IT environment**

**In 1998 TENS OF  
BILLIONS of dollars were  
wasted on failed IT  
projects!**

## Dr. Deming's 14 Points of Quality

1. Create constancy of purpose toward improvement of a product and service, with the aim to become competitive, to stay in business and to provide jobs.
2. Adopt the new philosophy, take on leadership for change

## Dr. Deming's 14 Points of Quality

3. Cease dependence on inspection to achieve quality.
4. End the practice of awarding business on the basis of the price tag.

## Dr. Deming's 14 Points of Quality

5. Improve constantly, and forever, the system of production and service to improve quality and productivity and constantly decrease costs.
6. Institute training on the job.
7. Institute leadership.

## Dr. Deming's 14 Points of Quality

8. Drive out fear.
9. Break down barriers between departments.
10. Eliminate quotas and slogans by management. Substitute leadership.
11. Remove the barriers that rob the worker of his right to pride of workmanship.

## Dr. Deming's 14 Points of Quality

12. Remove the barriers that rob management and engineering of their right to pride of workmanship.
13. Institute a program of education and self-improvement.
14. Put everybody in the company to work to accomplish the transformation.

QA/QC is a Business Value Proposition



## QA/QC

- **QA Quality Assurance**  
The process of assuring that quality control is in place and effective. Preventive in nature. The management of quality.
- **QC Quality Control**  
The process of finding defects. Corrective in nature. Performed by the person or group creating the product.

## Value of QA/QC

- **Understand and Represent the Interests of the Client/Key Stakeholders**
- **Establish and Maintain Effective Client/Key Stakeholder Relationships**
- **Detect, Analyze and Prevent Faults to reduce development costs**
- **Continually Assess Risk for the benefit of the Client/Key Stakeholders**



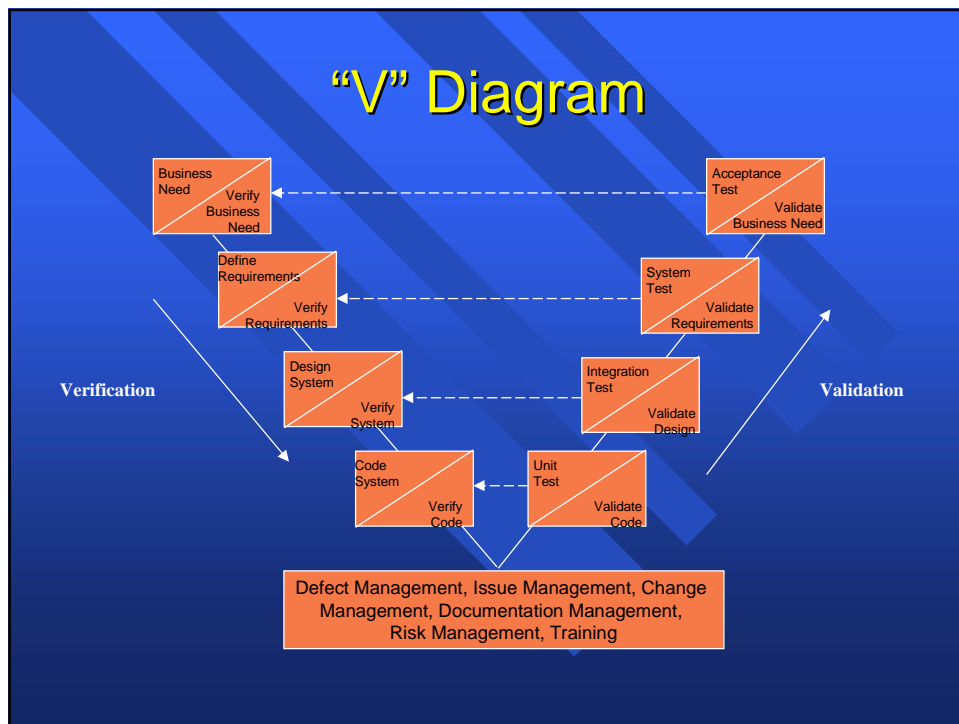
## **WHAT IS RISK?**

- **Probability of Something Failing**
- **Consequence of Something Failing**

## **Why Manage Risk?**

- **When we manage risk the business can manage the value related to:**
  - **Software Testing**
  - **Process Testing**
  - **Documentation**
  - **Change Control**
  - **Project Management**

## “V” Diagram



## Benefits from “V” Diagram

- Illustrates all software development approaches
- Illustration is clear and intuitive
- Assists in QA/QC activity management
- Illustrates the purpose of each activity
- Assists in “Scoping” and scope management

## Combined Benefits of “V” Diagram and Risk Management

- Provides common understanding, focus and priority to activities
- Supports and enhances working relationships between teams
- Enables QA programs to be directed to maximize the business value

## The Bottom Line

- You need to determine the acceptable level of risk in order to determine the appropriate level of QA/QC resources and effort to be allocated and the appropriate level and type of verification, validation and support processes



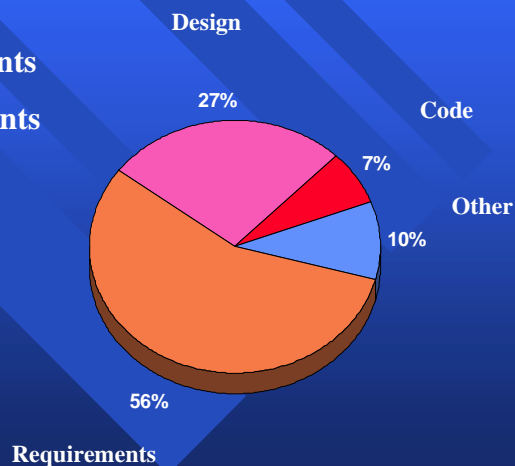
## Quality Management is Everyone's Responsibility

- QA standards must be designed and implemented to appropriately manage business risk in all activities in the "V" diagram
- QC must be effectively performed to collectively assess the business risks associated with systems at any point in the "V" diagram
- The sooner defects and risks are identified the more successful systems will be at managing the business risks

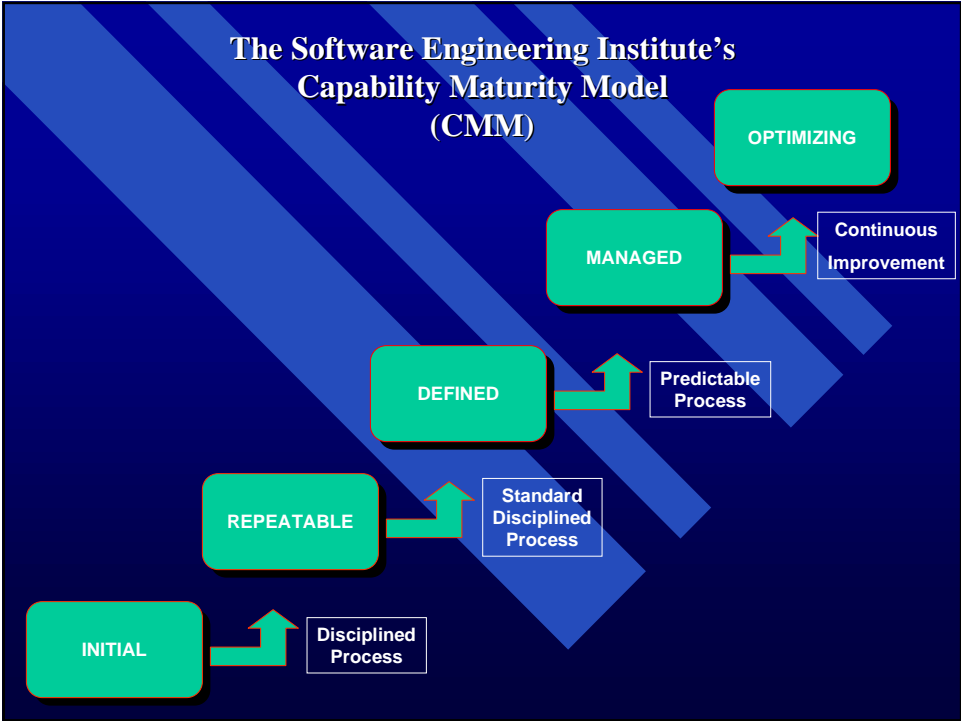
## Where Do Defects Originate?

### Ranking:

1. Incomplete Requirements
2. Ambiguous Requirements
3. Code Logic Defects
4. Defect Handling
5. Wrong Requirements



Source: Quality Assurance Institute 1995



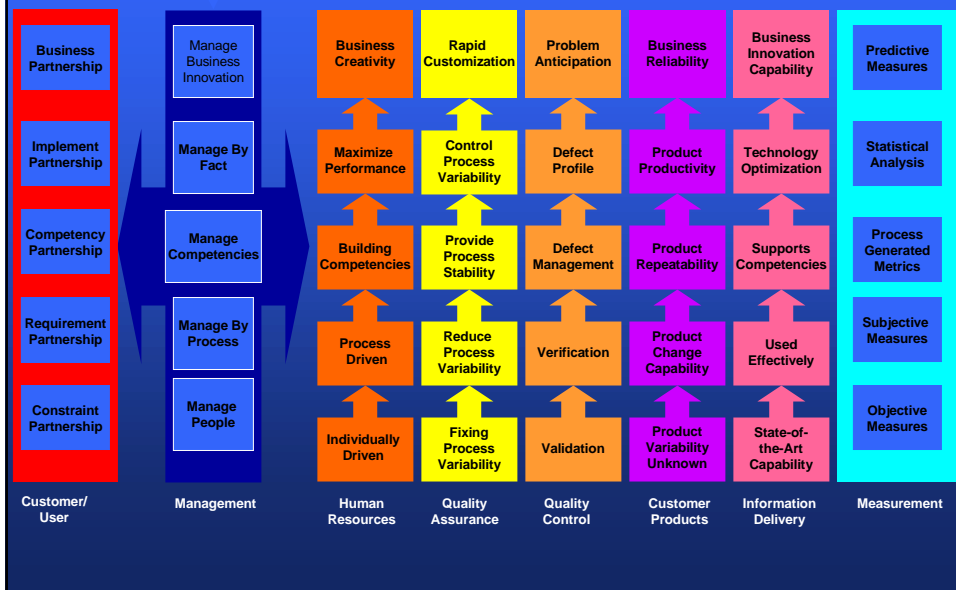
### Key Process Areas by Maturity Level

Level 5	Process Change Management Technology Change Management Defect Prevention	Optimized
Level 4	Software Quality Management Quantitative Quality management	Managed
Level 3	Peer Reviews Intergroup Coordination Software Product Engineering Integrated Software Management Training Program Organization Process Definition Organization Process Focus	Defined
Level 2	Software Configuration Management Software Quality Assurance Software Subcontract Management Software Project Tracking and Oversight Software Project Planning Requirements Management	Repeatable

## Quality Elements

- |   |   |
|---|---|
| <ul style="list-style-type: none"> <li>Management responsibility</li> <li>Management review</li> <li>Contract review</li> <li>Development plans</li> <li>Document and data control</li> <li>Control of customer products</li> <li>Process control</li> <li>Inspection and test status</li> <li>Internal quality audits</li> </ul> | <ul style="list-style-type: none"> <li>Organization</li> <li>Quality system</li> <li>Design control</li> <li>Quality plans</li> <li>Purchasing</li> <li>Product identification/traceability</li> <li>Inspection and test</li> <li>Control of quality records</li> <li>Training</li> </ul> |
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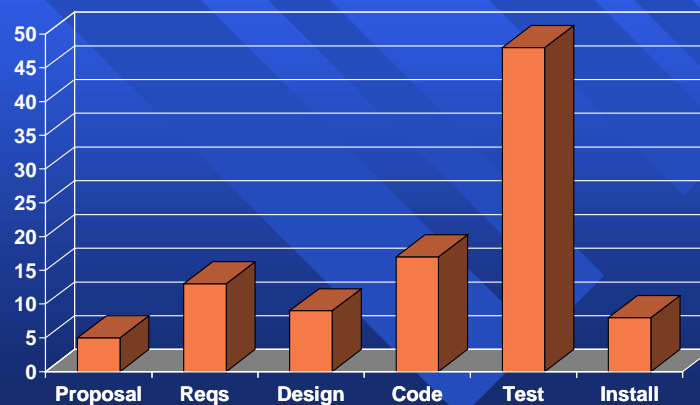
## The Quality Assurance Institute's Approach to Managing Quality in a Changing World



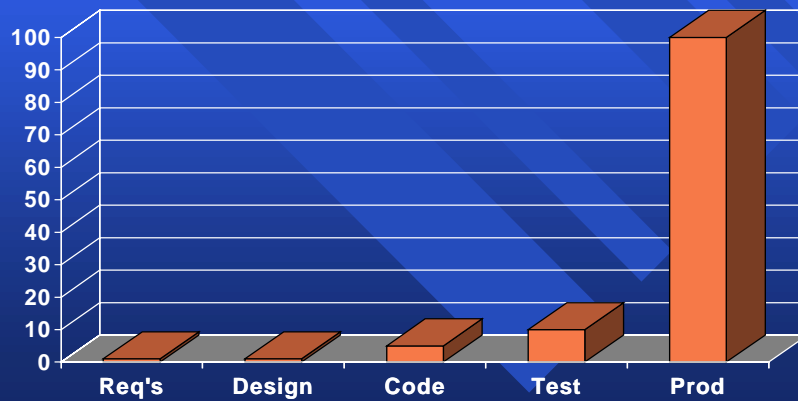
## State of the Industry

- Most organizations admit that their testing is:
  - Frequently ad-hoc
  - Poorly documented
  - Inconsistently executed
  - Primarily manual
  - Limited in scope
- Less than 50% of organizations using client/server testing tools practice any form of test methodology
- Only 25% of organizations perform regression testing
- The “defect removal rate” using ad-hoc testing methods is approximately 70% (medium and low defects)
- Separate development and testing life cycles

## Where Testing Value is Wasted



## The Relative Cost of Fixing Defects



## The Bottom Line

- Most defects are created in the early stages of a project
- Most defects are found in the later stages of a project
- It costs 10 to 100 times as much to fix a defect in the later phases of a project.



**THANK YOU FOR THIS  
OPPORTUNITY**