Software Quality Engineering

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Testing, Quality Assurance, and Quantiable Improvement
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Chapter 1: Overview

- Meeting People's Quality Expectations
- Book Organization/Overview/Usage
- Pre-requisite Knowledge

General Expectations

- General expectation:

  "good" software quality
- Objects of our study: software
  - software products, systems, and services
  - stand-alone to embedded
  - software-intensive systems
  - wide variety, but focus on software
- Quality (and how "good") formally defined

Quality Expectations

- People: Consumers vs producers
  - quality expectations by consumers
  - to be satisfied by producers through software quality engineering (SQE)
- Deliver software system
  - does what it is supposed to do

    needs to be "validated"
  - does the things correctly

needs to be "verified"

- show/demonstrate/prove it ("does")

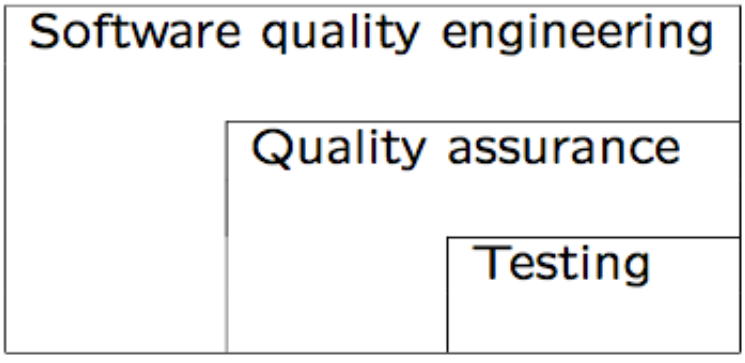
  modeling/analysis needed

Meeting Quality Expectations

- Difficulties in achieving good quality:
  - size: MLOC products common
  - complexity
  - environmental stress/constraints
  - flexibility/adaptability expected
- Other difficulties/factors:
  - product type
  - cost and market conditions
  - addressed later (especially Part III)
- "no silver bullet", but SQE (software quality engineering) helps

SQE as an Answer

- Major SQE activities:
  - Testing: remove defect & ensure quality
  - Other QA alternatives to testing
  - How do you know: analysis & modeling
- Scope and content hierarchy



  - Software quality engineering
  - Quality assurance

    - Testing

Contents

    - comparison, including testing
- Comparing different QA alternative
    - applicability and effectiveness
    - dealing with quality problems/defects: prevention/removal/tolerance
    - cost
    - overall comparison

Pre-requisite

- Math/statistics:
    - discrete math, logic, graph, etc.
    - probability and statistics
    - used in modeling/analysis.
- Background knowledge in CS/SE:
    - computer systems and programming
    - fundamentals of computing
    - general SE knowledge and experience