CISC/CMPE 327 Software Quality Assurance

Queen's University, 2020-fall

Lecture #2

Software Process Models

Software Process Models

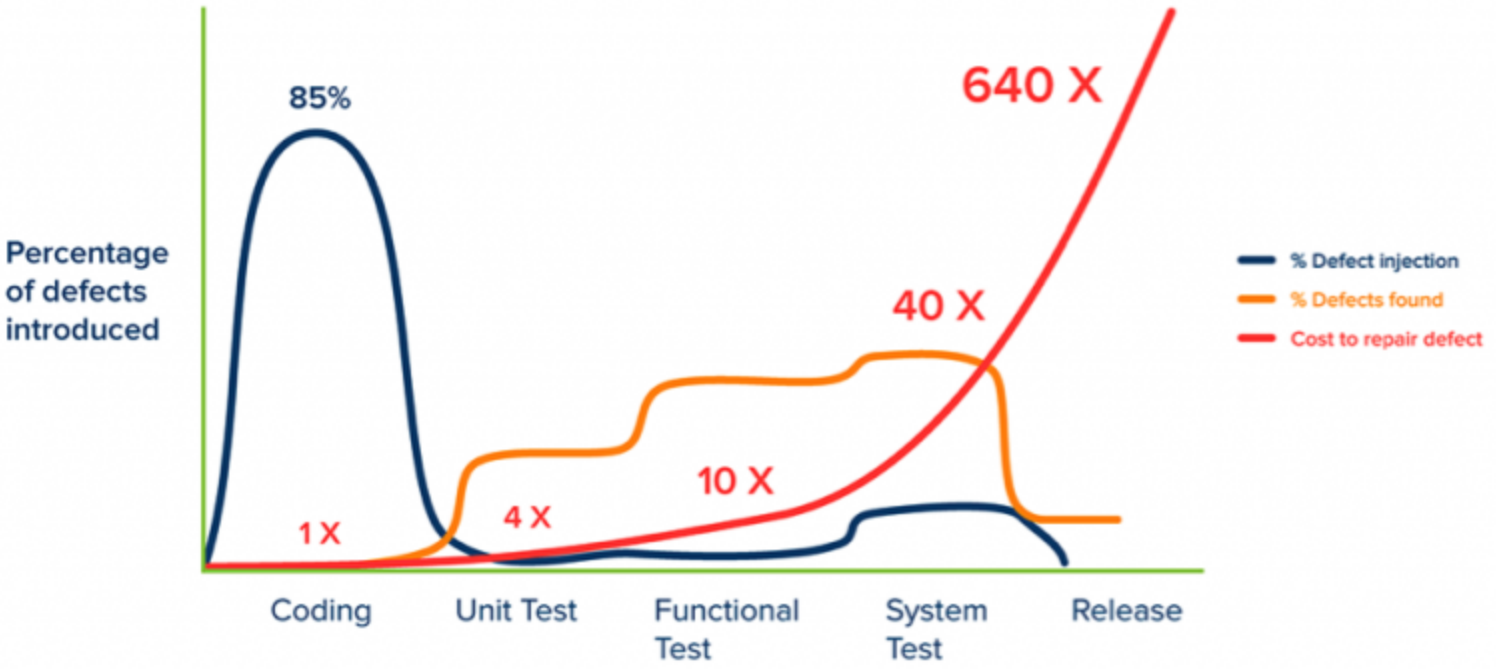
- Quality in Context
  - To understand the roles of quality assurance in software development, we must understand how software development works
    - We cannot discuss inspection, testing, and metrics in a vacuum
  - As background, therefore, we will begin by reviewing:
    - Major process models of the software development community, the ways software development efforts are organized
    - Some ways of assessing development process quality
    - Quality management standards for software processes

But first… Why bother?

- Example: U.S. Federal Aviation Administration
  - Operating an archaic air traffic control system
  - Started examining replacement options in 1981
  - By 1994, project was shelved after a cost of more than $2.6 billion and a lapsing delivery date
  - Some estimates put the economic cost of flight delays at $50 billion per year
  - Software is hard to replace!
    - Getting it right the first time is important

http://spectrum.ieee.org/computing/software/why-software-fails

But first… Why bother?



Jones, Capers. *Applied Software Measurement: Global Analysis of Productivity and Quality.*

Software Process Models

- Software Process Models
  - A software development process is a method for developing computer software that organizes the effort into a number of separate tasks and steps
  - This helps make it possible to develop large software systems using many people in an organized, manageable, and trackable way to retain control of the development
  - Having control addresses QA principle 1: know what you are doing

Software Process Models

- Fundamental Process Activities
  - All software process models share four fundamental process activities and differ primarily in how they are organized and interleaved
    - Specification: define requirements, functionality, and constraints
    - Development: build software to meet the specification
    - Validation: validate that it does what the customer wants
    - Evolution: evolve to meet changing needs and expectations