Course Outline

# Credibly Estimating and Managing Testing Projects

## Course Summary

### Description

Unreliable estimates are a major reason managers allocate inadequate time and resources to testing. Historically, estimating has been so weak in IT that some people simply assume it is impossible to estimate IT activities accurately. Test estimates are especially prone to problems because they often depend on other (unreliable) estimates.  In fact, though, it is possible to estimate more accurately; and huge direct and indirect benefits can result. This interactive seminar describes key principles of effective estimating and how to apply them to the unique aspects of testing.  And, rather than just being a static up-front exercise, the course shows dynamic techniques that effective estimators use throughout the project to control progress as well as to refine and improve their estimates and estimating skills.  Exercises enhance learning by allowing participants to practice applying practical techniques to realistic examples.

### Objectives

By the end of this course, students will learn:

- Positioning estimation and control within an overall structured testing process.
- Appropriate uses and limitations of rapid top-down estimates.
- Work breakdown structure bottom-up estimating techniques and issues.
- Test planning and design methods for determining the number and nature of tests to be run.
- Identifying additional testing effort required besides test execution.
- Controlling testing activities and refining estimates throughout the project.
- Managing test activities, time, and resources to deliver quality systems on-time and in-budget.

### Topics

- Managing Testing as A Project
- Estimation's Place in Test Process
- Top-Down Estimating
- Bottom-Up Estimating
- Test-Based Task Estimates
- Other Testing Tasks to Estimate
- Estimating the Schedule
- Re-Estimating During the Project
- Directing and Controlling Testing

### Audience

This course has been designed for QA and testing specialists, managers, analysts, designers, programmers, auditors, and users who need estimates of testing time and resources.

### Duration

Two Days

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I. **Managing Testing as A Project**
   A. Testing as a project within overall project
   B. Why knowing how to test is not enough
   C. Key Project Manager roles/competencies
   D. Project management, development lifecycles
   E. Why we get impossible deadlines/budgets
   F. Countering Parkinson's Law
   G. Establishing credibility, managing by facts
   H. Testing's double budget/schedule whammy
   I. Project Manager, Test Manager deliverables
   J. Test Managers must excel Project Managers
   K. Projects succeed/fail in the first 15 minutes

II. **Estimation's Place in Test Process**
   A. Planning purposes, key to project delivery
   B. Types and levels of testing to estimate
   C. Conventional reactive test planning
   D. Proactive Testing risk-based strategy
   E. IEEE Std. test planning structure benefits
   F. Test estimation strategy
   G. Master Test Plan counterpart to project plan
   H. Detailed Test Plans for manageable focus
   I. Test Design Specifications control points
   J. Test Cases, fundamental building blocks
   K. Manual vs. automated testing
   L. Testing roles and responsibilities

III. **Top-Down Estimating**
   A. "Knowing" estimating is impossible
   B. How effective estimators differ
   C. Top-down estimating advantages
   D. Tester to developer ratio-based estimates
   E. Percentage of total budget for testing
   F. Lines of code, function points sizing
   G. Calibrating effort to size
   H. Historical testing effort as basis
   I. General and testing-specific issues
   J. Impacts rule-of-thumb methods cause
   K. Appropriateness and caveats for use
   L. Parametric estimating algorithms

IV. **Bottom-Up Estimating**
   A. Need to identify test activities regardless
   B. Major reason estimates are inaccurate
   C. Work-breakdown structure technique
   D. Level-by-level increase in precision
   E. Near- and far-term detail differences
   F. Identifying effort by resource and skill level
   G. Implicit vs. explicit duration
   H. Work packet roll-up
   I. Addressing contingencies and oversights
   J. Relating to top-down estimates, fudge factor
   K. Adjusting for skill level

V. **Test-Based Task Estimates**
   A. What is a test case
   B. Use case scenarios
   C. White box structural control flow tests
   D. State analysis-based tests
   E. Data flow tests
   F. How many tests do we need, quality levels
   G. Historical defect statistics, precision
   H. Risk-based testing
   I. Estimating execution effort, duration
   J. Sizing test documentation
   K. Creating test data
   L. Analyzing and reporting results
   M. Defect isolation
   N. Defect advocacy

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# Course Outline (cont.)

O. Test set-up and tear-down time
P. Factoring in defect, fix, and bad fix rates
Q. Determining test cycles, regression tests
R. Exploratory and ad hoc testing
S. Test automation factors and issues
T. Unique factors for each type of special test

### VI. Other Testing Tasks to Estimate
A. Establishing the test environment, lab
B. Data creation, loading, extraction, updating
C. Receiving and installing software
D. Acquiring automated testing tools
E. Getting training
F. Anticipating and addressing delays
G. Administrative demands on TM, Test Team
H. Recruiting and hiring staff
I. Coordinating with developers and users
J. Manual vs. automated productivity
K. Applying inspections, higher-yield methods
L. Make vs. buy, outsourcing

### VII. Estimating the Schedule
A. Separating task definition from scheduling
B. Productive time scheduling practicalities
C. PERT and weighted averages risk reduction
D. Gantt charts and resource leveling
E. Concurrencies and dependencies
F. Dependency networks
G. Dependency network diagramming
H. Critical Path and Critical Chain
I. Value of slack
J. Risk reserves, contingencies, and Plan B
K. Constraints, imposed dates
L. Identifying and addressing resource conflicts
M. Fast tracking, schedule compression
N. What's it have to do with testing

### VIII. Re-Estimating During the Project
A. Defect categorization, trends

B. Recording actuals against estimates
C. Projecting defects remaining
D. Statistical sampling
E. Seeding and mutation
F. Linking two independent measures
G. Identifying systematic estimating errors
H. Release criteria
I. Structural, functional degrees of coverage
J. Requirements capability assurance
K. Monitoring and projecting arrival rate
L. Identifying and attacking bug colonies
M. Reporting testing status, business value

### IX. Directing and Controlling Testing
A. Management vs. leadership
B. Delegating and encouraging effort
C. Motivation, rewards, and recognition
D. Supervising and reviewing performance
E. Manager is between team and organization
F. Negotiating commitments and resources
G. Monitoring against budget and schedule
H. Applying leading indicators
I. Assuring quality of the testing, too
J. Measuring defect detection efficiency
K. Catching problems and adjusting in-process
L. Earned value measure of completion
M. Cost/benefit analysis and communication
N. Is earlier really cheaper
O. Automated PM tools suitability, warnings
P. Metrics for communication
Q. Metrics for control and improvement
R. Reporting to management, key to influence