Software Process Improvement

Team Software Process (TSP)

Personal Software Process (PSP)

Software Engineering as Process

- Engineering implies Measurement
- Measurement is a Repeatable Process
- Process is Doing
- Doing implies Observing
- Observing produces ideas for improvement

Measurement & Improvement

- What is measurable?
  - Estimated and Actual time to write a section of code
  - Number of errors found prior to shipment
  - Number of defects found post-shipment
  - Total days from start of project to first shipped release
  - Lines of code – function point count --- user story count
  - Total cost spent on developing, advertising and shipping product
  - ✓ Many (most?) software engineering activities are measurable
- What is improvement?
  - Decreasing product costs by eliminating engineering "waste"
  - Shortening development timelines by writing better code the first time
  - Increasing product quality by reducing shipped defects
  - ✓ Improvement means making activities efficient

Economic Value of Good Process

- Poor process costs time and money*
  - More than two-thirds of project costs go to testing and stabilizing the product
  - Jain implemented TSP at Microsoft-India:
    - > 66% projects went to Zero-Defects in 6 months
    - 94% projects were delivered on time
- Good process makes money
  - Reliable software estimation means true costs can be accurately assessed (and thus correct business decisions can be made)
  - Software quality control means confident delivery of "good enough" software (and strong customer sales)

*Info from: Mukesh Jain, *Delivering Successful Projects with TSP and Six Sigma: A Practical Guide to Implementing Team Software Process* (Nov.2008)

Personal Software Process

- 4 Measurements
  - Size
    - Lines of code, user stories, function points
    - Appropriate to component
    - Consistent
  - Effort
    - Time to complete task (minutes)
    - By task type (coding, unit test, documenting, etc.)
  - Quality
    - Errors (found during unit test)
    - Defects (found after delivery to QA team or customer)
  - Schedule
    - Planned vs Actual
    - Detailed progress tracking throughout project

Team Software Process

- Group-based PSP
  - Quality Control
  - Secure Software
  - Improve Process Management
  - Effective Team Organization
- Establish team goals
- Define team roles
- Assess project risks
- Produce an effective project plan

Worth A Look

- The Cathedral and the Bazaar by Eric Raymond
- Anything by Watts Humphrey
  - Example: http://www.stsc.hill.af.mil/crosstalk/2005/03/0503Humphrey.html
- Jain's book
  - http://www.amazon.com/Delivering-Successful-Projects-TSP-Sigma/dp/1420061437/
- The SEI (Software Engineering Institute @ Carnegie Mellon):
  - Team Software Process -- http://www.sei.cmu.edu/tsp/
  - Personal Software Process -- http://www.sei.cmu.edu/tsp/tools/bok/index.cfm
- Jason Gorman's blog
  - http://www.testingreflections.com/node/view/5542
- And, of course, Joel Spolsky, Steve McConnell and
  - http://www.joelonsoftware.com/
  - http://blogs.construx.com/blogs/stevemcc/default.aspx
  - http://www.codinghorror.com/