

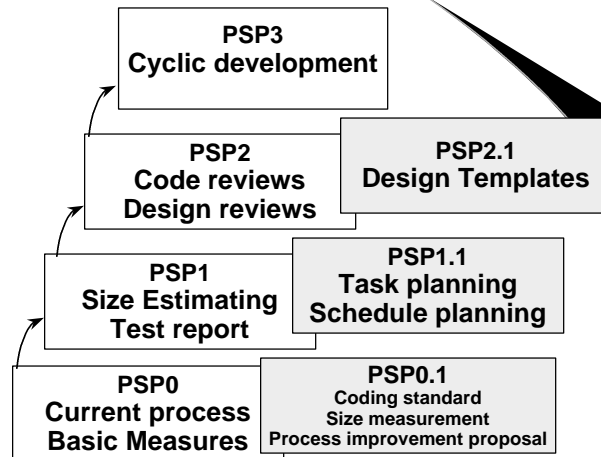
Practical Perspectives on the Personal Software ProcessSM

Noopur Davis
Davis Systems

Agenda

- PSP Overview
- PSP Experiences: Training
- PSP Experiences: Practicing
- PSP Data
- Questions?

PSP Overview: A defined and measured framework



Source: *A Discipline for Software Engineering* by Watts Humphrey

PSP Experiences: Training

- At the beginning...
 - ~15% of total time in compile
 - Almost as much time in compile as in de
 - 12 defects per KLOC unit test defect densi
 - ~30% estimating error

PSP Experiences: Training (continued)

- ...and at completion of training
 - 88% average reduction in compile defect density.
Compile time reduced to almost zero.
 - 50% average reduction in unit test defect density.
 - 86.5% aggregate yield.
 - Aggregate Appraisal to Failure Ratio (A/FR) of 2.0.
 - No significant change in estimation accuracy or productivity.

The PSP Quality Message

- The PSP teaches engineers that quality software is their personal responsibility.
- Their objective is to remove all defects before the first compile.
- When a program has many defects in compile, it will likely have many defects in unit test, system test, and in the field.

PSP Experiences: Practicing

- The basic PSP tools
 - Time log
 - Defect log
 - Lines of Code (LOC) counter
- Most other PSP data is derived from the time log, the defect log, and the LOC counter.

PSP Experiences: Practicing

- More advanced PSP tools
 - Size and effort estimating database
 - PROBE object category size database
 - Project Plan summary templates

Time Log

PSP Time Log

Name	Phase	Date	Start	End	Interrupt	Comment
Module1	Planning	11/1/97	10:59 AM	12:11 PM	0	
Module1	Design	11/1/97	12:12 PM	12:52 PM	0	
Module1	DR	11/1/97	1:28 PM	1:42 PM	0	
Module1	Code	11/1/97	2:00 PM	2:47 PM	5	Phone call
Module1	Code	11/1/97	3:03 PM	3:21 PM	0	

Start Interrupt Stop Interrupt Close

Defect Log

PSP Defect Log

Num	Name	Date	Type	Phase Injected	Phase Removed	Start	End	Fix Defect	Comment
1	Module1	11/1/97	Syntax	Code	CR	3:59 PM	4:01 PM	0	Identifier misspelled
2	Module1	11/1/97	Assignment	Code	CR	4:02 PM	4:04 PM	0	Precedence error
3	Module2	11/4/97	Function	Design	DR	9:07 AM	9:32 AM	0	Algorithm incorrect

Close

LOC Counter

- Initially, used LOC counter developed during PSP training.
- Enhanced LOC counter.
- CCCC, a source code analyzer which also produces LOC counts, is available from http://www.fste.ac.cowan.edu.au/~tlittlef/cc_cc_ug.htm.

Size Estimation History

PSP Size Estimates			
Name	Estimated New and Changed LOC	Estimated Object LOC	Actual New and Changed LOC
Module1	83	75	68
Module2	889	827	1057
Module3	563	524	921

Close

Effort Estimation History

PSP Effort Estimates			
Name	Phase	Estimated Effort	Actual Effort
Module1	Planning	35	22
Module1	Design	19	23
Module1	DR	15	17
Module1	Code	24	21

Close

Other Tools

- Microsoft Word™ templates.
- Microsoft Excel™ spreadsheets.

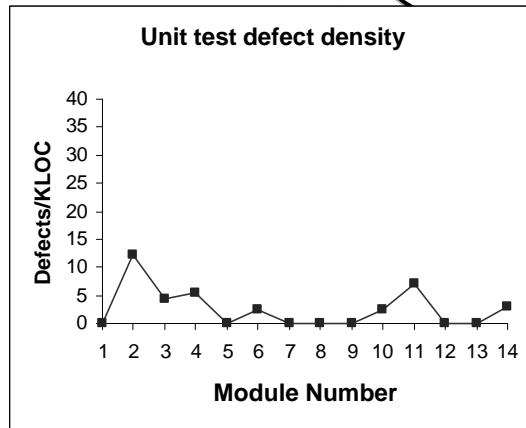
PSP Experiences: Practicing

- Tools are nice but practicing the PSP requires *discipline*
 - Planning and reviewing are not fun
 - The urge to compile before review is strong
 - I miss the debugger

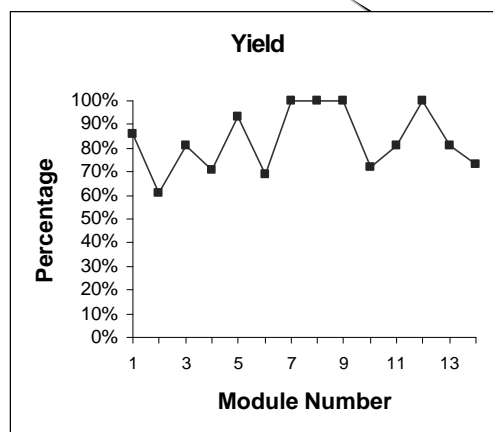
PSP Experiences: Motivation

- The results of practicing the PSP
 - 74% improvement in unit test defect density.
 - Average yield is above 80%.
 - Average schedule estimating error continues to improve.
 - The following charts show some of the metrics collected on fourteen C++ modules developed using the PSP.

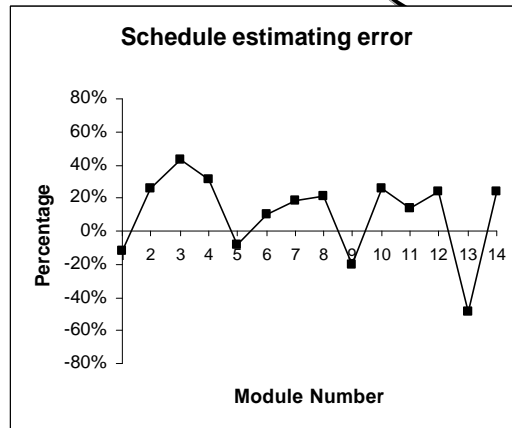
PSP Data: Unit test defect density



PSP Data: Yield



PSP Data: Schedule Estimation Error



Summary

- Practicing the PSP requires discipline.
- Tools help.
- The results provide the motivation to continue.

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