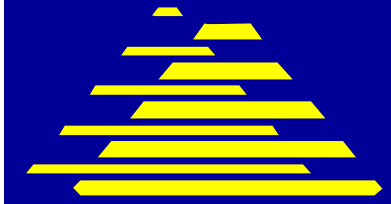

PSP, TSP, XP, CMMI… eating the alphabet soup!

Daniel M. Roy

SSTC 2011

19 May 2011

PSP, TSP, Personal Software Process and Team Software Process are service marks of CMU
CMM and Capability Maturity Model are registered in the U.S. patent and trademark office

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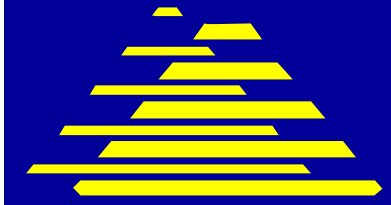


Agenda

- Robust, fragile, agile
- From CMMI to TSP
- The manifesto
- XP and SCRUM vs. CMMI
- PSP and TSP at work
- Earned value for the rest of us
- Synergy
- Surf the next wave!

Different tacks

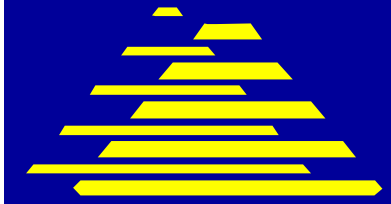
Manifesto for Agile Software Development

We are uncovering better ways of developing
software by doing it and helping others do it.
Through this work we have come to value:

Individuals and interactions over processes and tools
Working software over comprehensive documentation
Customer collaboration over contract negotiation
Responding to change over following a plan

That is, while there is value in the items on
the right, we value the items on the left more.

Kent Beck	James Grenning	Robert C. Martin
Mike Beedle	Jim Highsmith	Steve Mellor
Arie van Bennekum	Andrew Hunt	Ken Schwaber
Alistair Cockburn	Ron Jeffries	Jeff Sutherland
Ward Cunningham	Jon Kern	Dave Thomas
Martin Fowler	Brian Marick	



XP 12 KPs

- The Planning Game
- Small Releases
- Metaphor
- Simple Design
- Incremental testing
- Refactoring
- Pair Programming
- Collective Ownership
- Coding Standards
- 40-hour Week
- On-site Customer
- Continuous integration

Scrum and CMMI V1.3

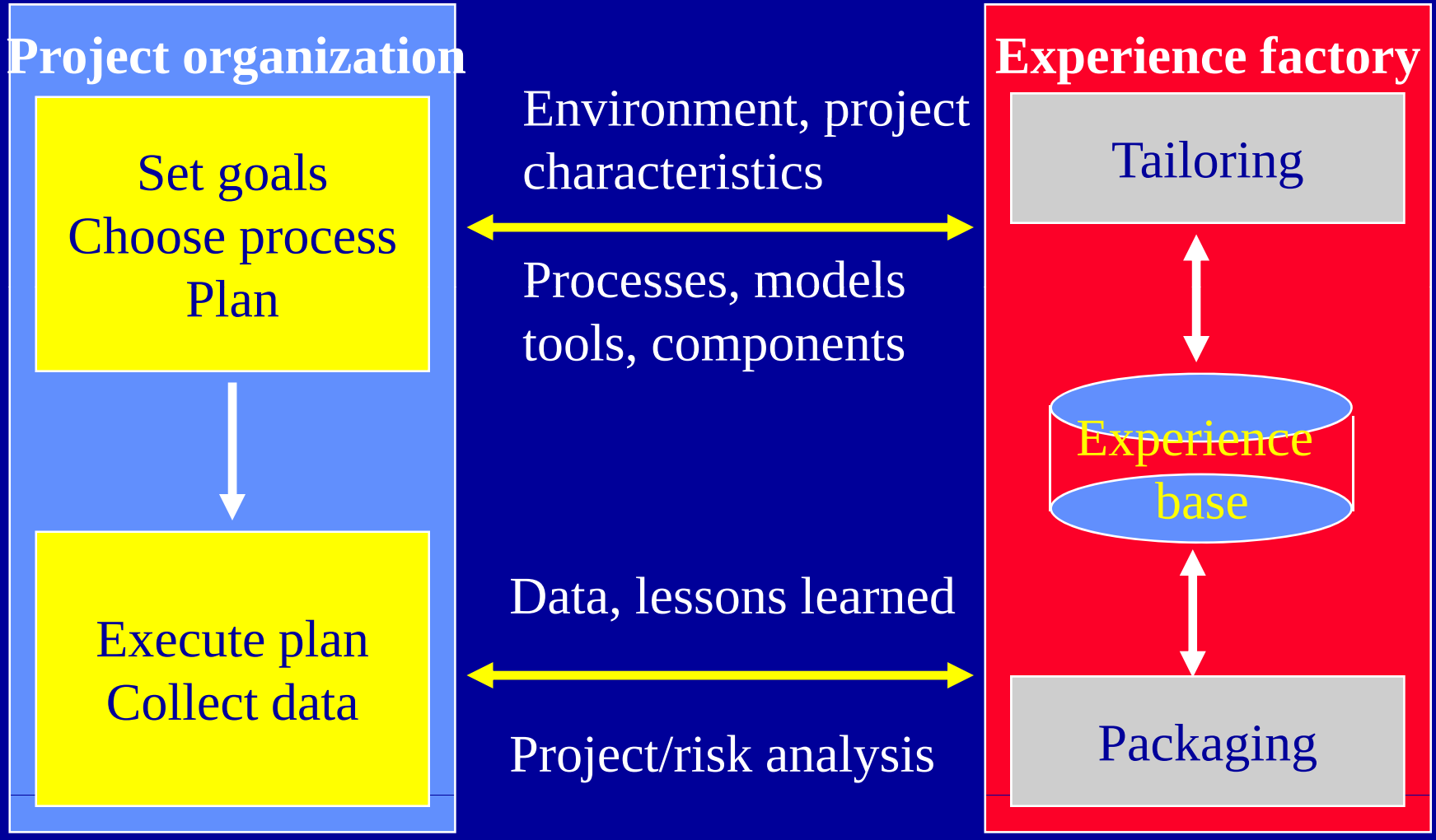
Level	Focus	Process Areas
5 Optimizing	Continuous process improvement	Organizational Performance Management Causal Analysis and Resolution
4 Quantitat. Managed	Quantitative management	Organizational Process Performance Quantitative Project Management
3 Defined	Organization engineering process standardization	Requirements Development Technical Solution Verification Validation Organization Process Focus Organization Process Definition Organizational Training Integrated Project Management Risk management Decision Analysis and Resolution Product Integration
2 Managed	Basic Project management	Requirements management Project Planning Project Monitoring and Control Supplier Agreement Management Measurement and Analysis Process and Product Quality Assurance Configuration Management

From CMMI to TSP

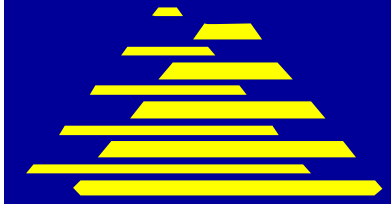
The CMMI

- demonstrates development practices and improvement techniques at the individual and small team level
- provides a framework for data-driven improvement

The experience factory



From 'The experimental paradigm in software eng.', Rombach, Basili, Selby, Springer-Verlag, 1994



What's a PSP?

The PSP is a self improvement paradigm based on individual procedures and **data**

A small set of scripts, standards and forms

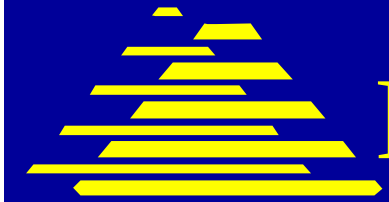
A simple but highly effective measurement framework

Self management based on **individual metrics**

Fostering commitment to quality principles

It is an agile **level 5 process for individuals**

It is a also a one person implementation of Basili's Quality Improvement Paradigm (experience factory)



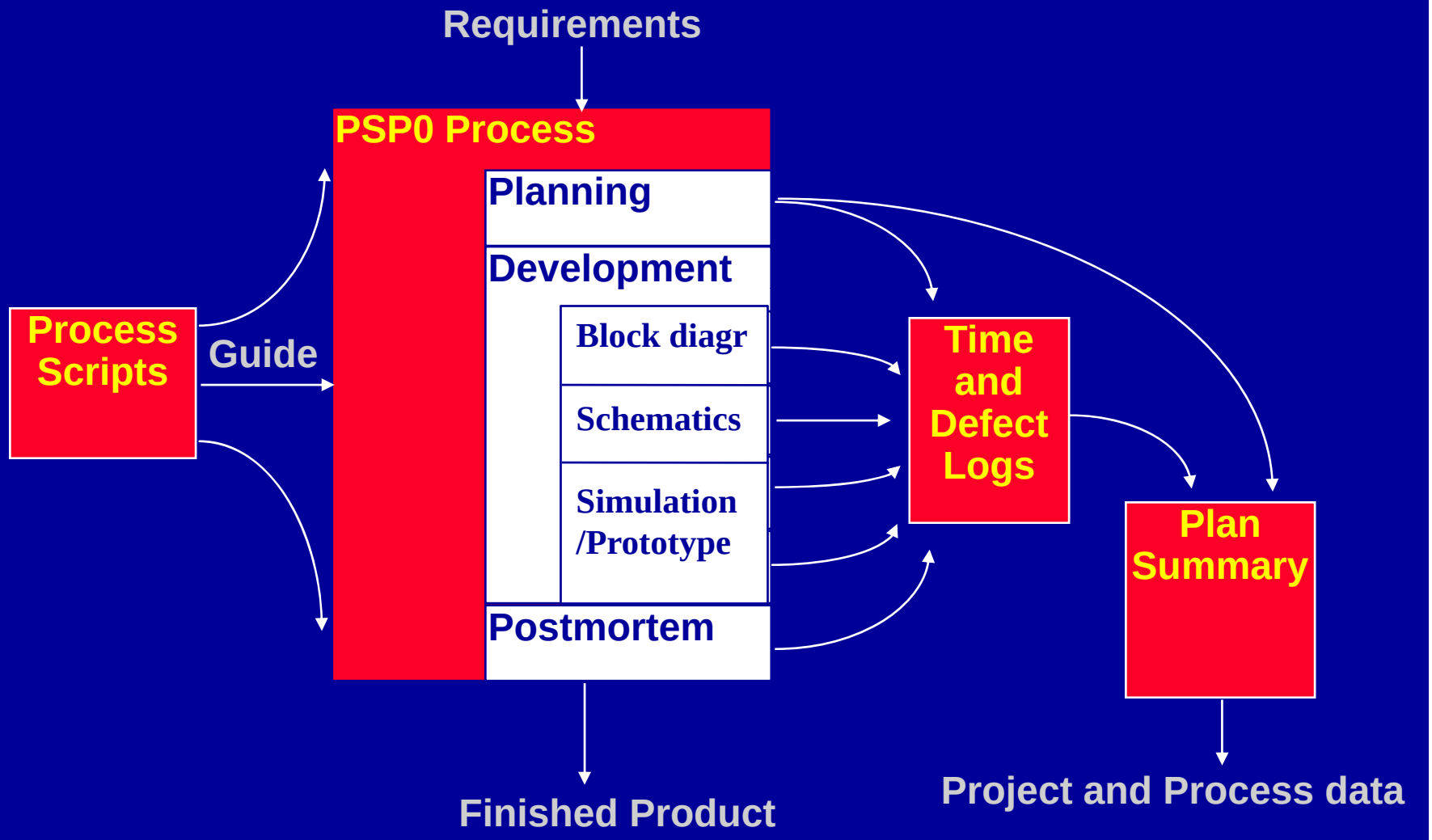
From a great founding father

"At the Software Engineering Lab (NASA GSFC) we have applied evolutionary improvement concepts (PDSA) to the development domain…

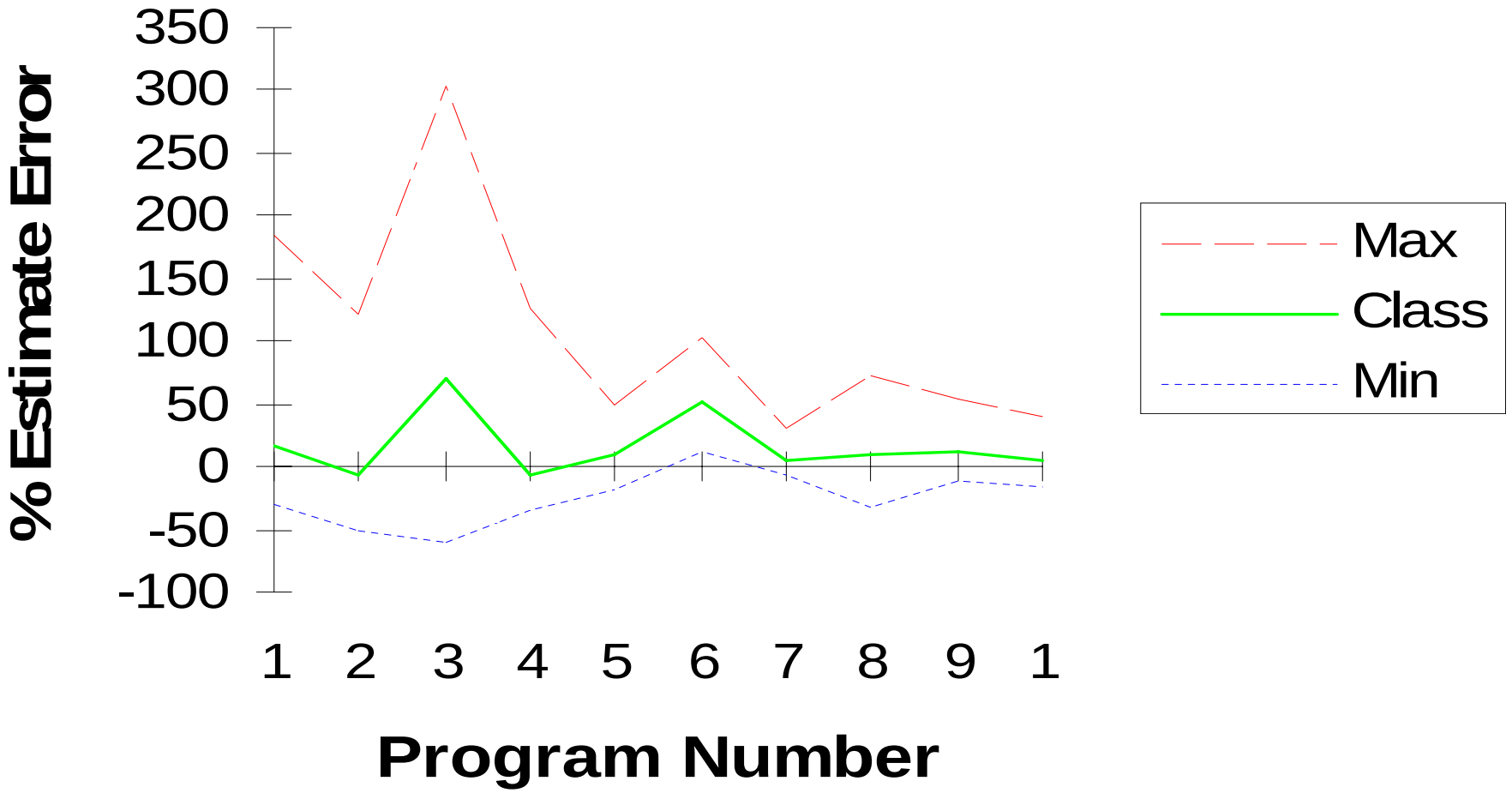
With this [PSP] book, Watts Humphrey has developed an evolutionary improvement paradigm at the personal level by providing a mechanism for learning through experience, measurement and feedback."

Vic Basili foreword to Watts' book
A discipline for software engineering

The PSP Process Flow

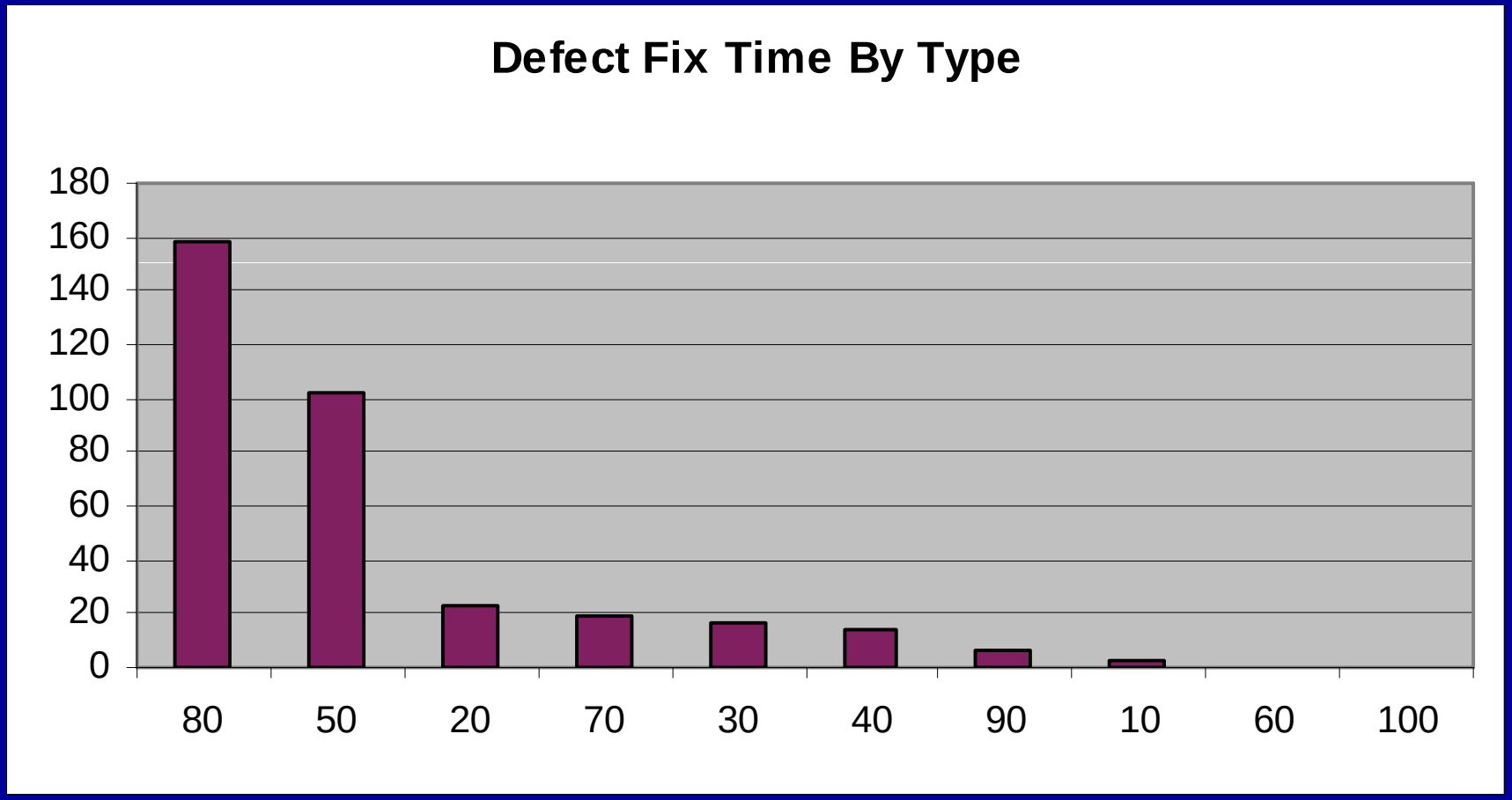


Time Estimating Accuracy - % Error

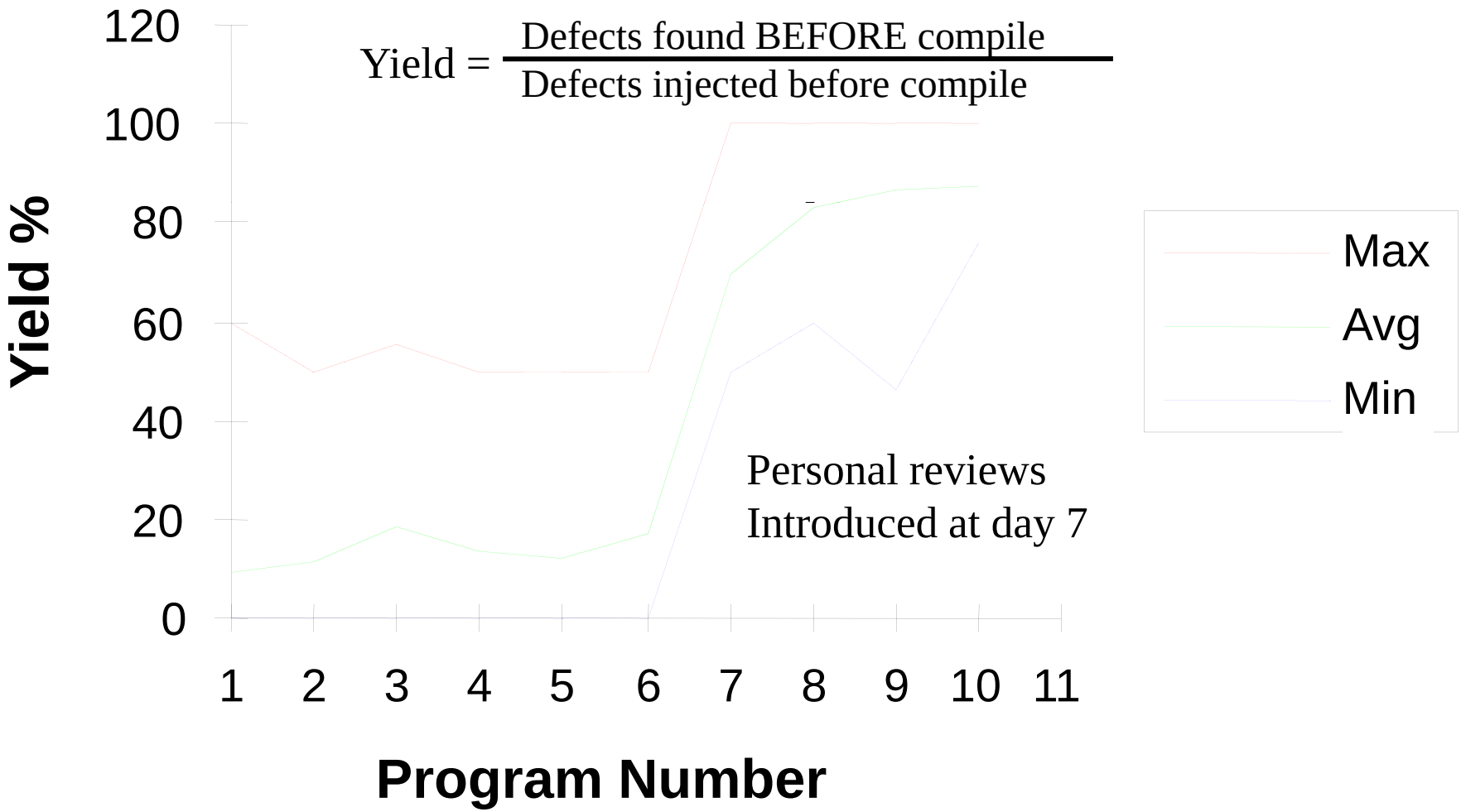


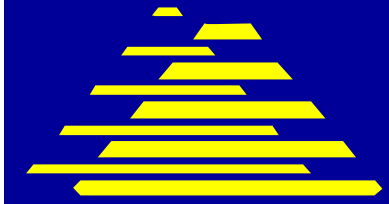

PSP

Data driven improvement



Yield - All Students, All Programs





PSP Return On Investment

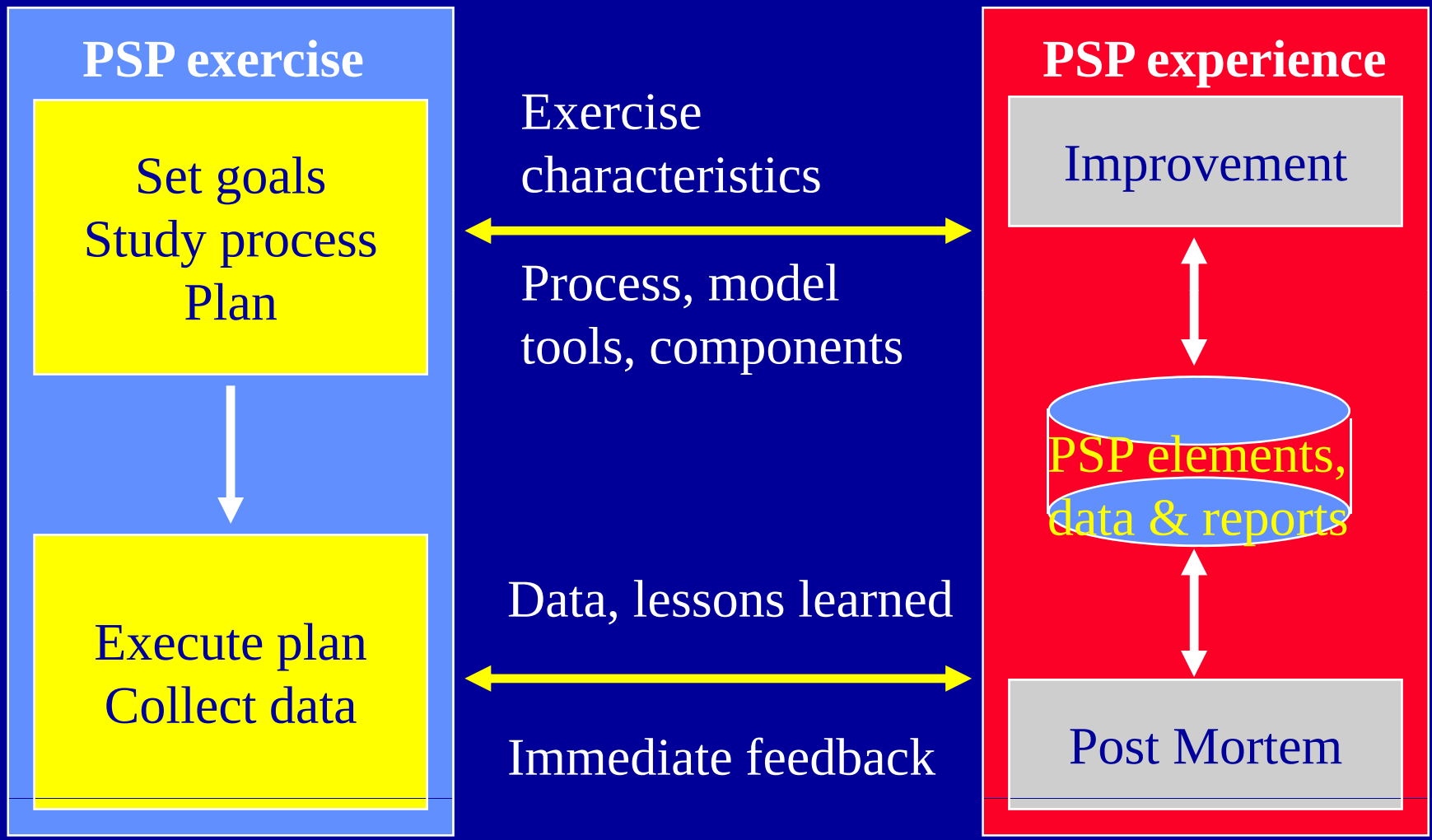
The following[illegible] system test (I&S) rev[illegible]efore and after PSP trai[illegible]

Example from Microsoft
It took 250 engineers an entire year to remove 30,000 defects from Windows NT 4.0
At 2,000 h per staff year that's 500kh
Or 500/30=16.7 ~17h per defect
Usual rule of thumb is 10-40h/defect in I/S test

		After PSP
Defects/KLOC into Unit Test	40	10
Yield for Unit Test	50%	50%
Defects/KLOC into I&S Test	20	5
I&S Defect fix time/KLOC	200	50

Integration and system test rework savings are 150 hours per KLOC (training **costs recovered in less than 6 weeks** of work!)

PSP: An experience workshop?



What's a TSP?

The Team Software Process uses the PSP principles to

- Apply the PSP sound **engineering discipline** to project work
- Form and help perform **outstanding** self directed **teams**
- Produ…wn by the team
- Proac…he plan
- Contin…**rocesses**
- To pro…

CMMI SCAMPI A results since 2002:
maturity level 1 to 2 takes 14 months
maturity level 2 to 3 takes 17 months
maturity level 3 to 4 takes 15.5 months
maturity level 4 to 5 takes 12.5 months

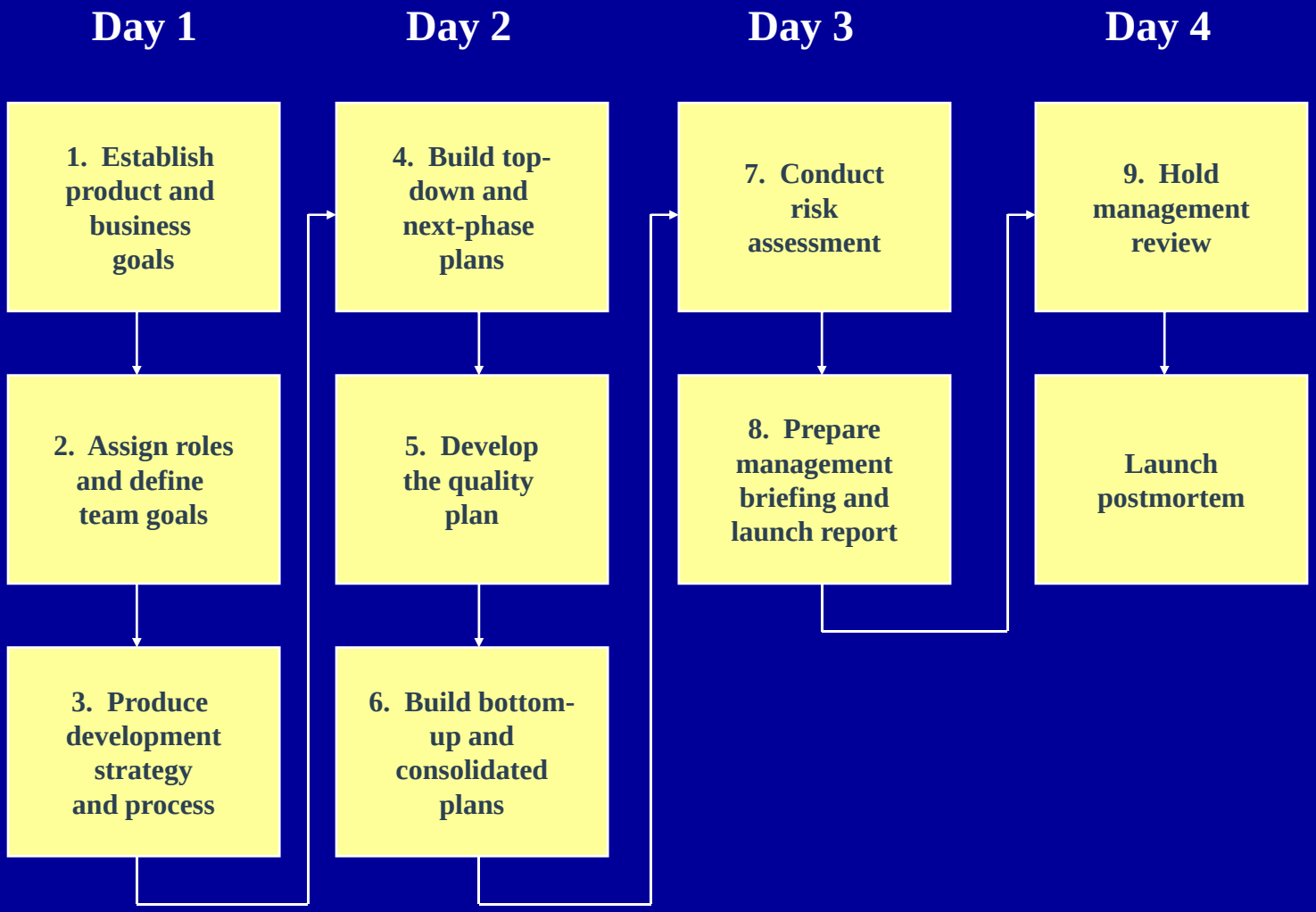
PSP/TSP accelerate CMMI maturation by a factor 2..3 (level 1 to 4 in 24 months)[1]

The TSP is an agile **level 5 process for small teams**

The TSP starts with a project "launch"

1- Julie Switzer, NAVAIR TSP symposium 2008

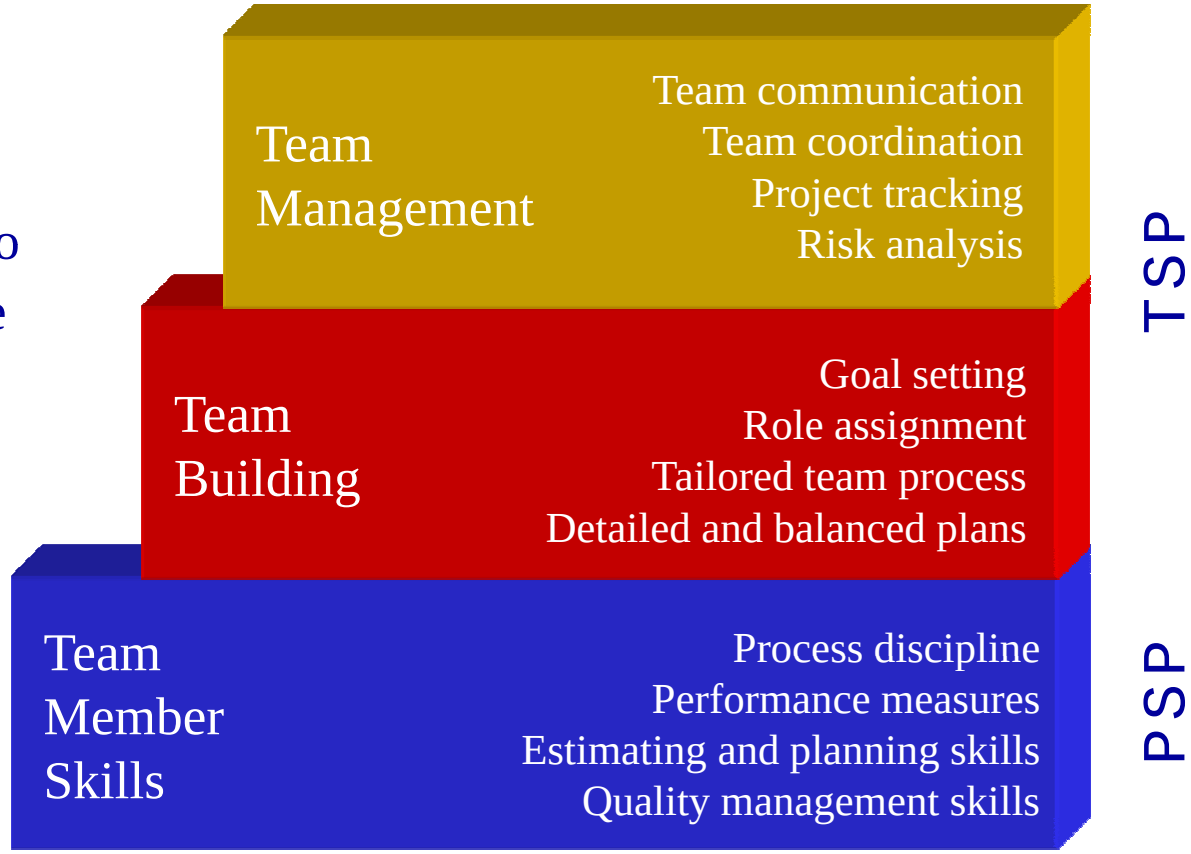
What's a launch?



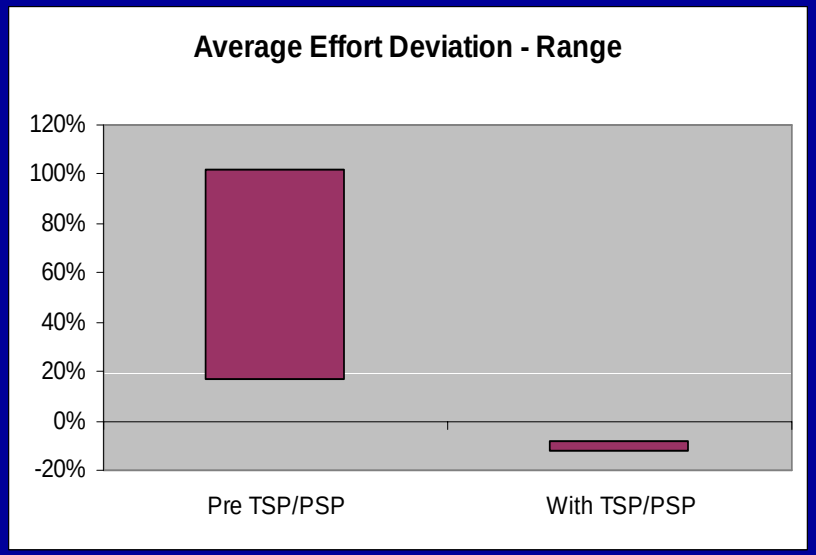
Building High-Performance Teams

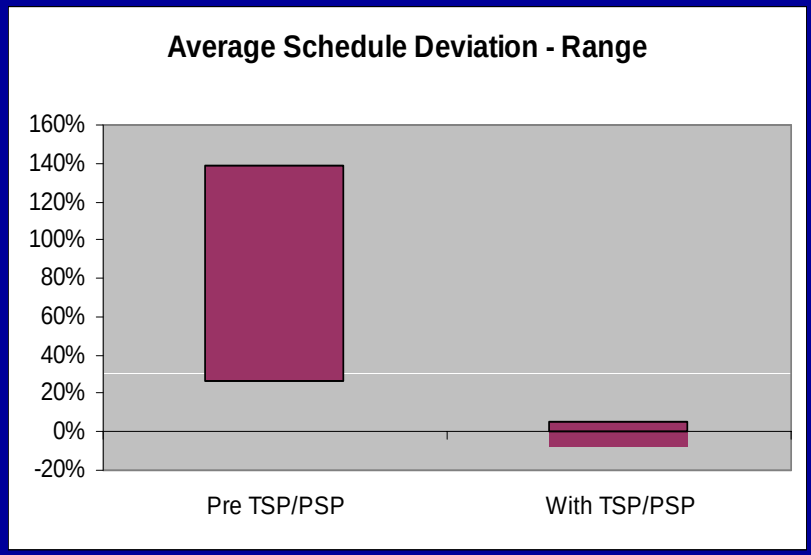
The TSP strategy is to improve performance from the bottom up.

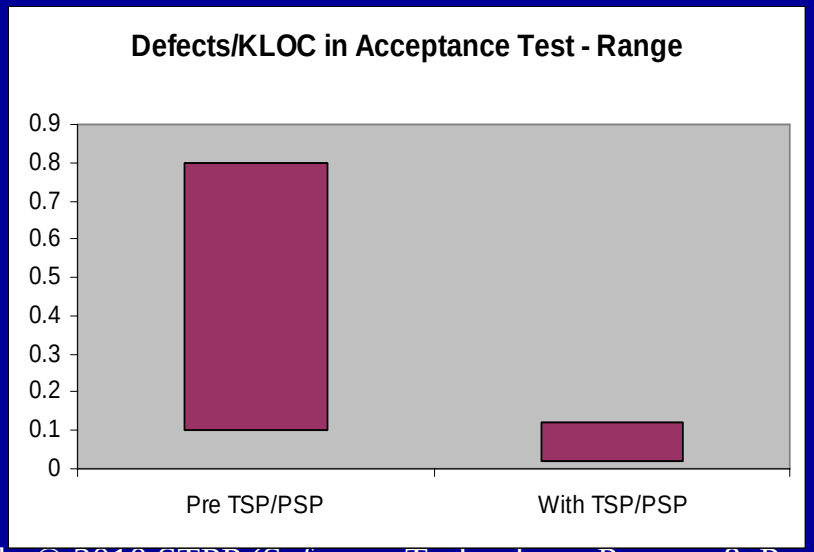
This strategy starts with PSP training.

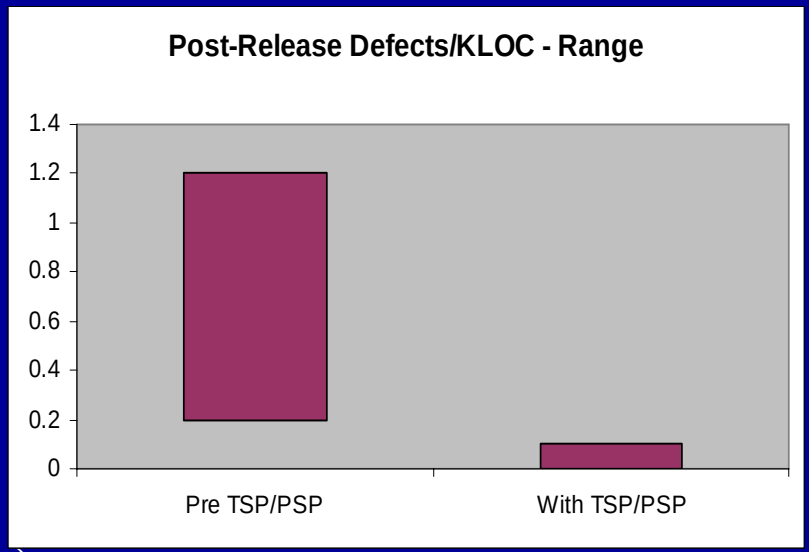


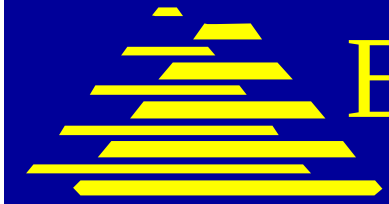
PSP/TSP impact







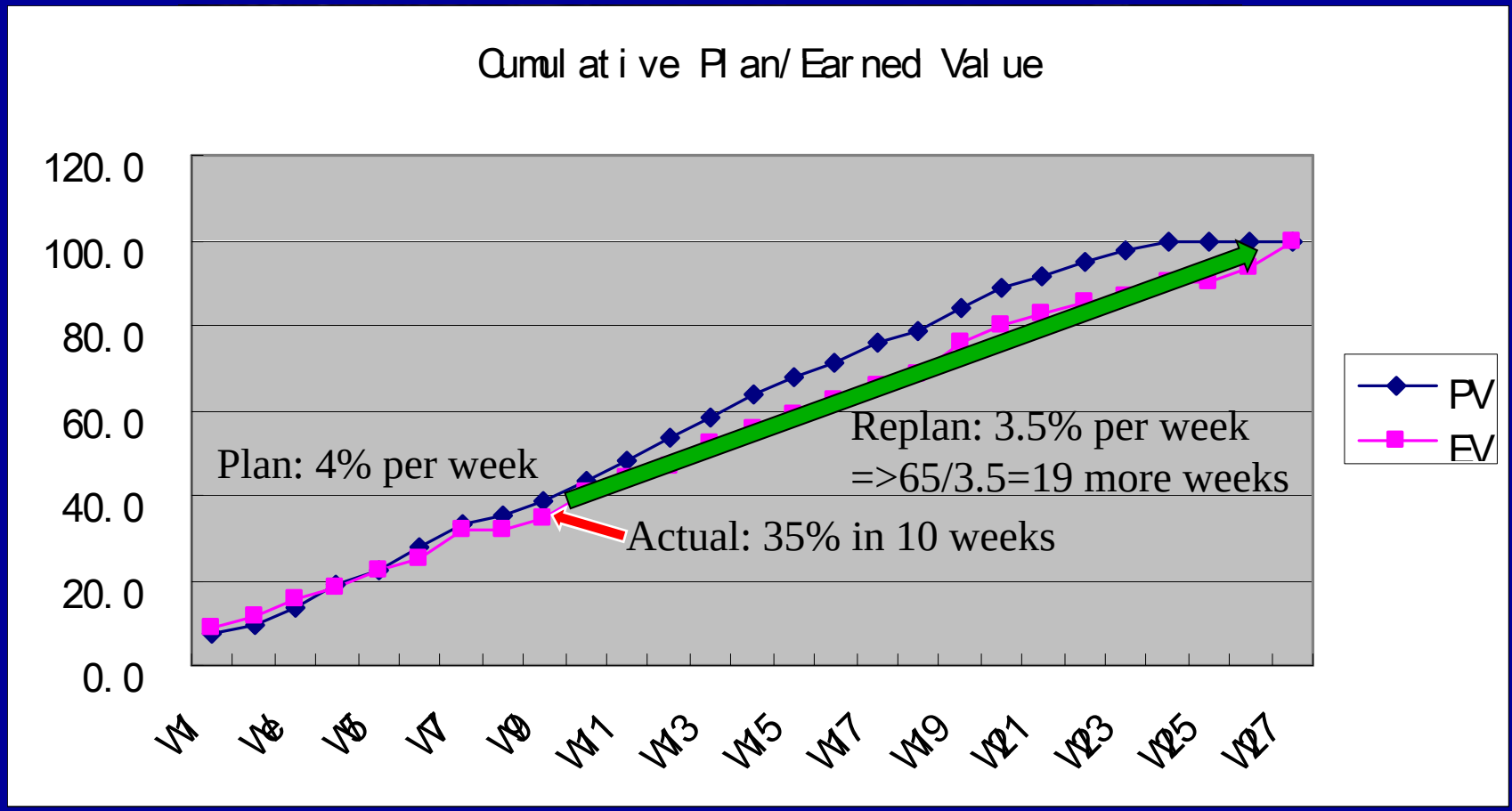




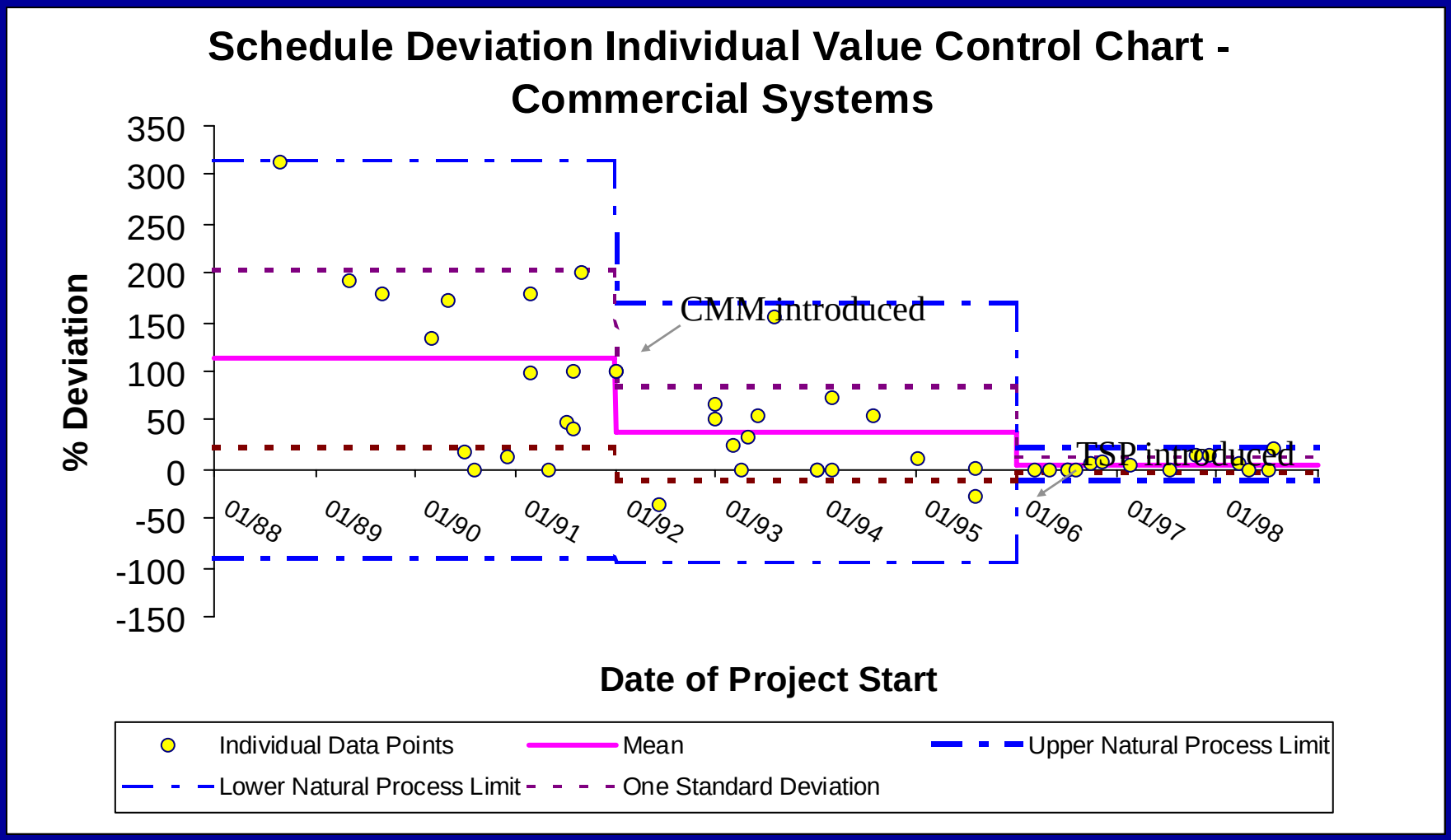
Earned value for the rest of us

My week	EV	Estim.	Sum	Done by
Prepare presentation	25%	5h	5h	Tuesday
Design a little	15%	3h	8h	Tuesday
Attend useless meeting	7.5%	1.5h	9,5h	Wednesday
Code a little	35%	7h	16.5h	Friday
Test a little	12.5%	2.5h	19h	Friday
Write status report	5%	1h	20h	Friday
		20h		

First PSP/TSP project in PRC September 2008..March 2009

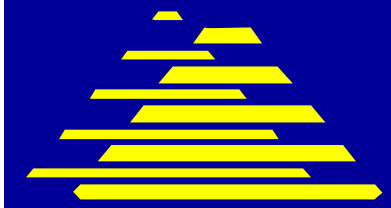


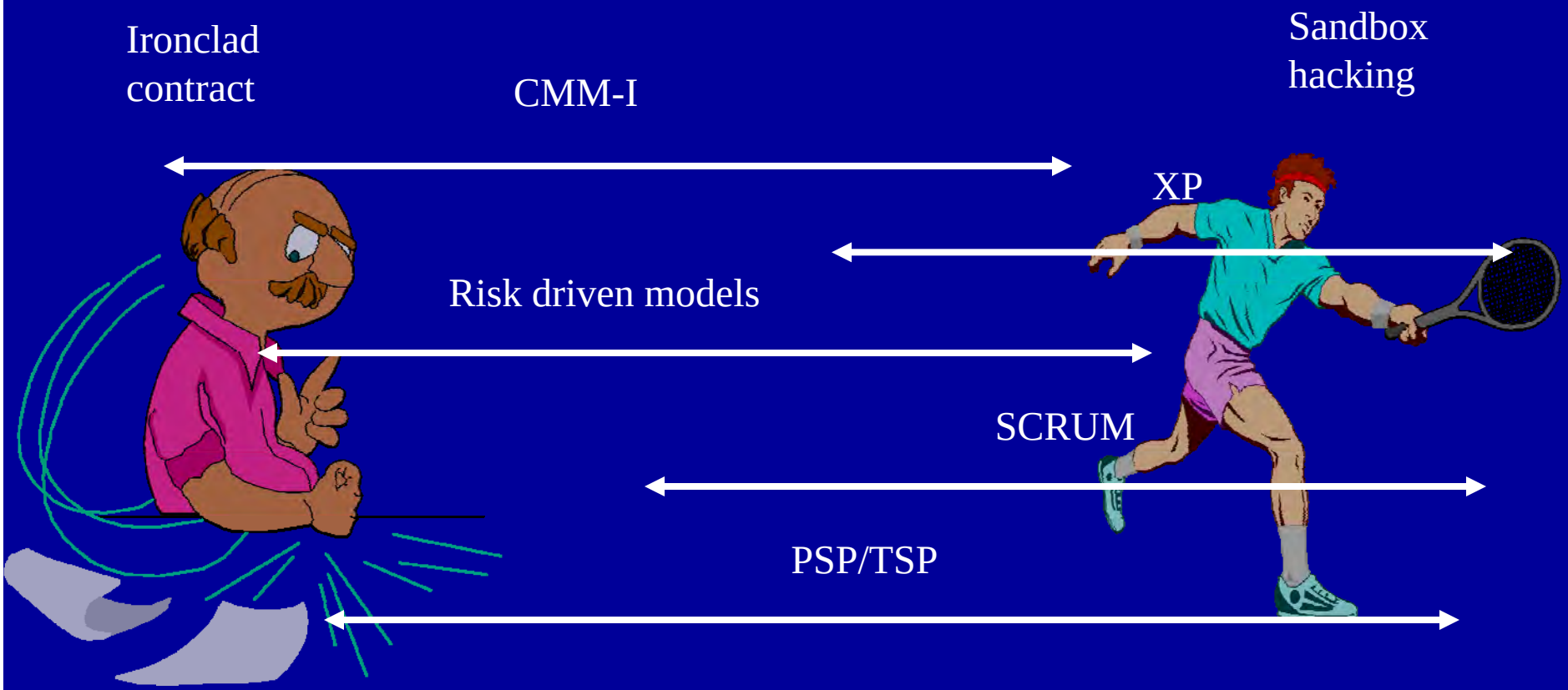
Predictable Schedules



[Source: AIS]

Rigor continuum





Agile CMMI vs. “pure” agile

Similarities

Self directed teams

Well defined roles

Working sw and biz value

Incremental development

Manager as coach

Quick reaction/incremental

Reviews/inspections

Meaningful meetings

People interaction

Cultural evolution

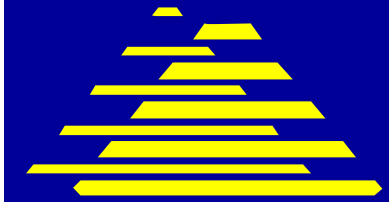
Differences

True blue agile quite a bit more:

- collegial
- code driven
- project centered
- test focused
- time boxed

And quite a bit less worried about

- detailed process documentation
- early phases planning/tracking
- product doc. (except code)
- detailed data (but there is some)
- CMM stuff!!!



It's the People stupid!

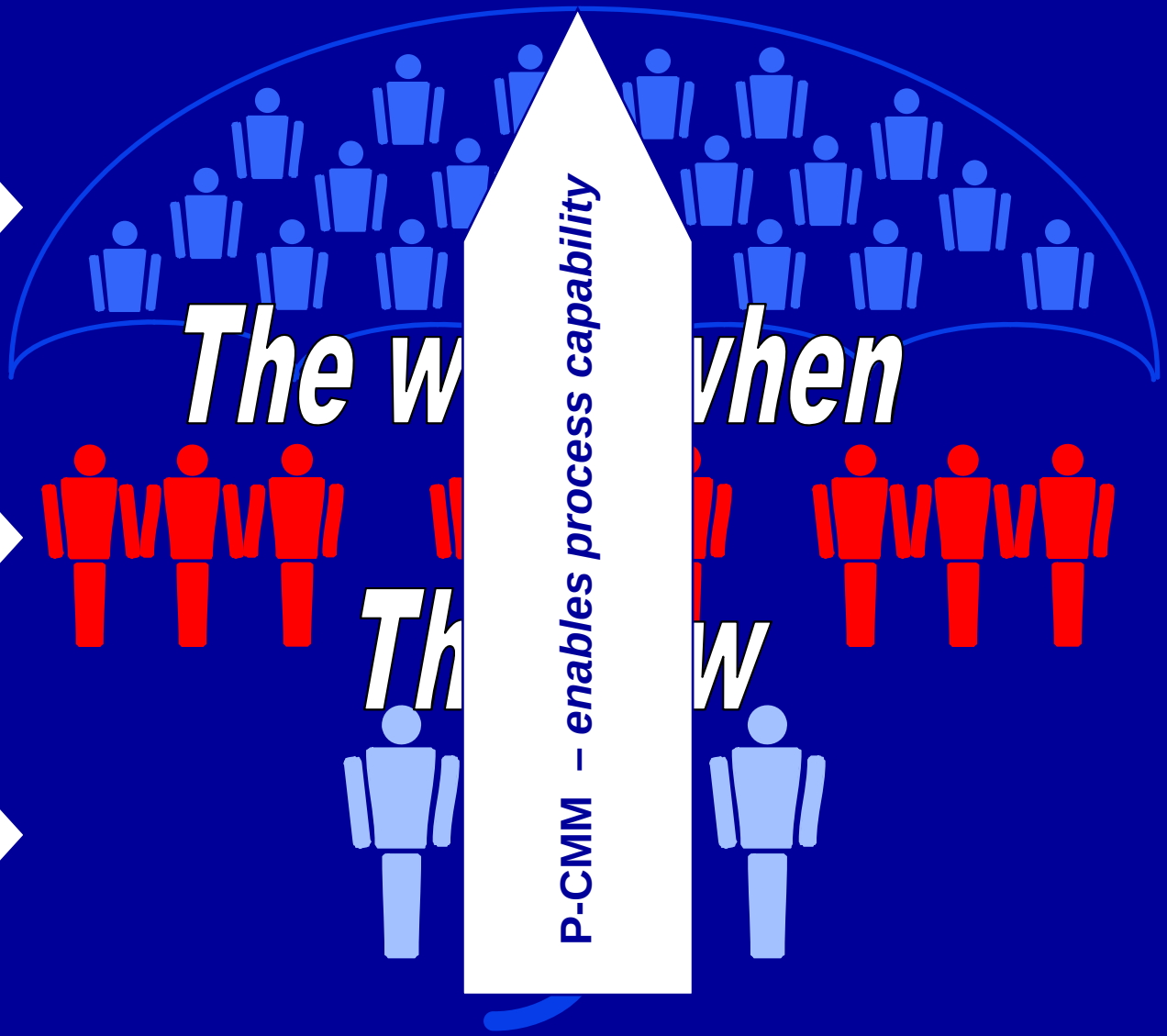
Levels	People CMM Threads			
	Developing Capability & Competency	Building Workgroups & Culture	Motivating & Managing Performance	Shaping the Workforce
5 Optimizing	Continuous Capability Improvement		Organizational Performance Alignment	Continuous Workforce Innovation
4 Predictable	Mentoring Competency Based Assets	Competency Integration Empowered Workgroups	Quantitative Performance Management	Organizational Capability Management
3 Defined	Competency Development Competency Analysis	Workgroup Development Participatory Culture	Competency Based Practices Career Development	Workforce Planning
2 Managed	Training and Development	Communication & Coordination	Compensation Performance Management Work Environment	Staffing

Process synergy: AIM

CMMI - *Builds organizational capability*

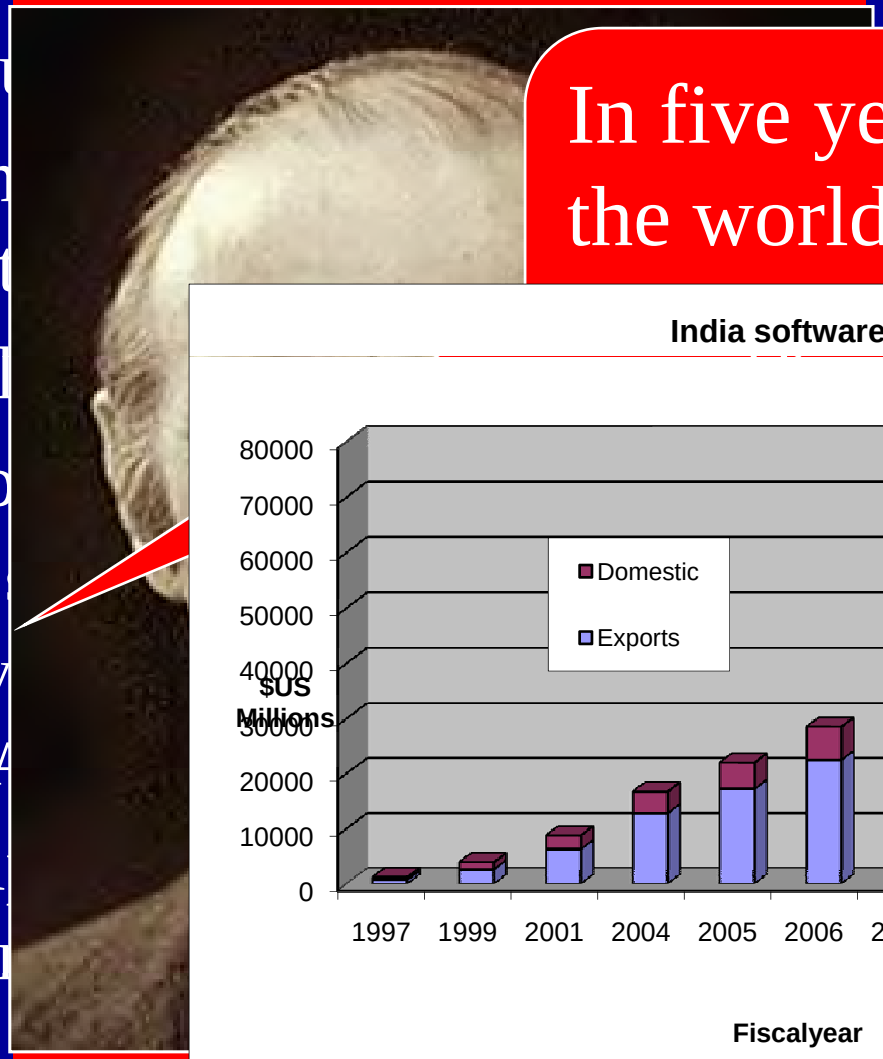
TSP - *Builds quality products on cost and schedule*

PSP - *Builds project team skill & discipline*

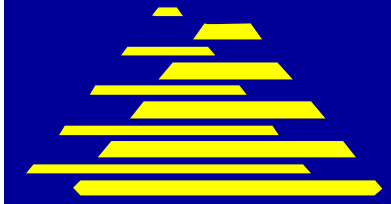


AIM: The next wave

- India has s
- Indian com
  cost advant
- But rising l
- Competitio
  - China
  - Ex sov
  - Latin A
- Every com
  consistent



In five years, I want the world to be



Conclusion

- Identify, mentor, nurture and lavishly praise local leadership
  - Get a (preferably knowledgeable) champion
  - Work the management chain before and after the TSP-like SPI planning session
- Make the culture data hungry one byte at a time
- You're not good at planning? Plan often!
- Surf the next wave: Go PSP/TSP (it is part of AIM)
- Watch failure cost of quality go down, show ROI and celebrate… But keep going!

Questions?