



# **“Five years from now...” Why Mexico will be #1 in IT**

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- **The tools of competitiveness**
  - **CMMI**
  - **PSP/TSP**
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  - **Understanding cultural differences**
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- **A winning strategy**
- **Conclusiones y recomendaciones**

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# Profiting from software



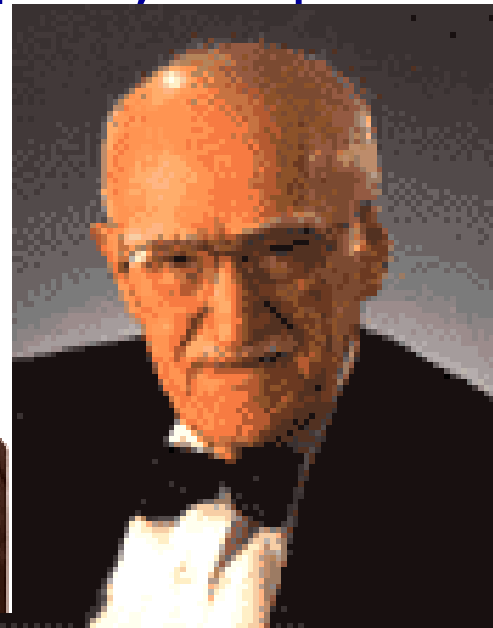
*"When I mention software to senior executives, I get lots of reactions. Most are frustrated. They complain about missed commitments, quality problems, and unpleasant surprises... No one mentions the business opportunities of software... While most executives would agree that the software part of their business is growing very quickly, they never think of it as an asset or an opportunity"*

Watts S. Humphrey  
*Winning with software*

# What's a CMMI?



- The CMMI derives from Schewart, Deming,



# CMMI Dev 1.2 PAs



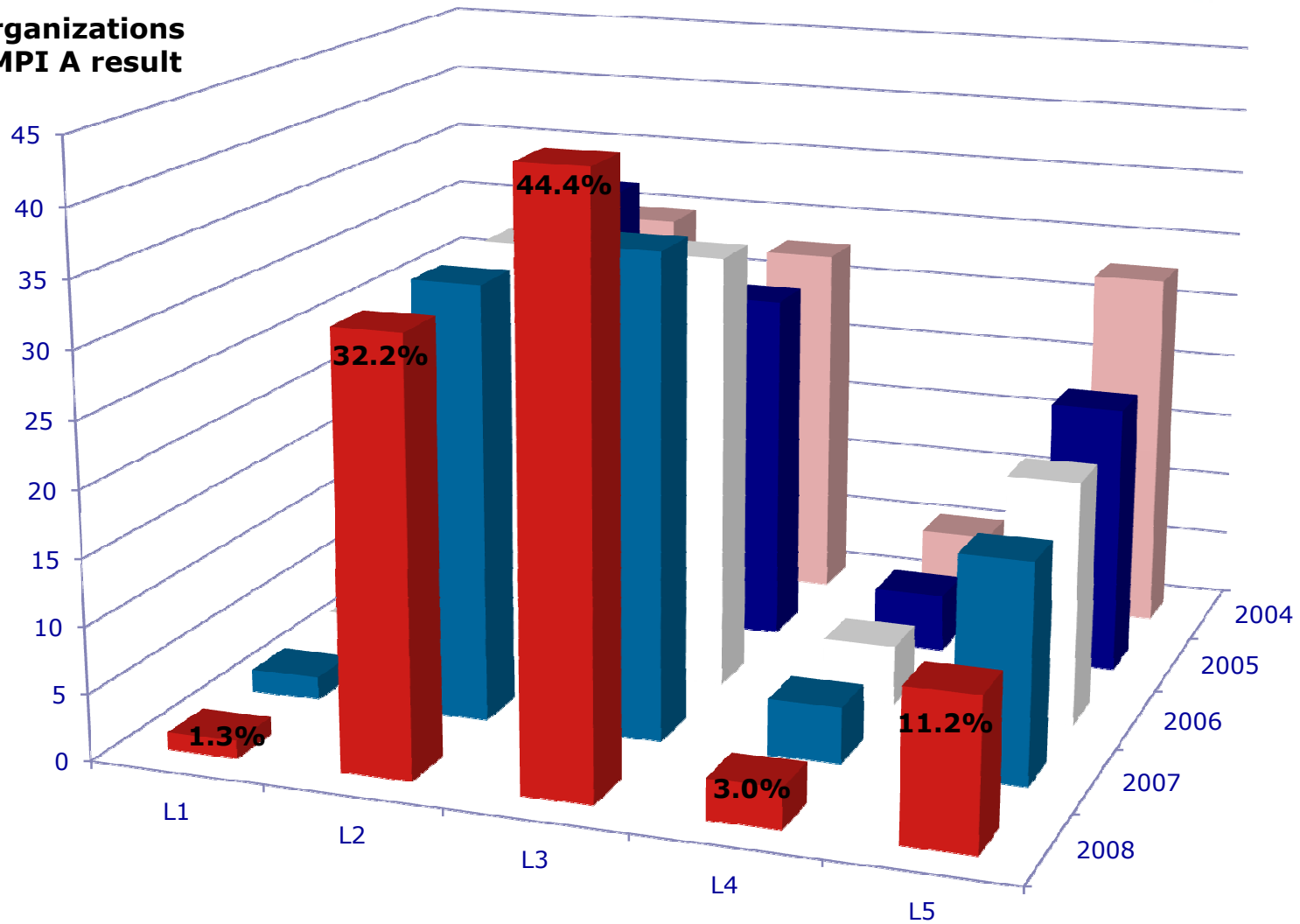
Level	Focus	Key Process Areas
5 <b>Optimizing</b>	Continuous process improvement	Organizational Innovation and Deployment Causal Analysis and Resolution
4 <b>Quantitat. Managed</b>	Quantitative management	Organizational Process Performance Quantitative Project Management
3 <b>Defined</b>	Organization 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 <b>Managed</b>	Basic Project management	Requirements management Project Planning Project Monitoring and Control Supplier Agreement Management Measurement and Analysis Process and Product Quality Assurance Configuration Management

## 1 Initial

# CMMI maturity evolution



**% organizations  
SCAMPI A result**



# CMMI impact



<b>Performance Category</b>	<b>Median Improvt</b>	<b>Number Data Pts</b>	<b>Lowest Improvt</b>	<b>Highest Improvt</b>
Cost	34%	29	3%	87%
Schedule	50%	22	2%	95%
Productivity	61%	20	11%	329%
Quality	48%	34	2%	132%
Customr Satisf.	14%	7	-4%	55%
ROI	4.0 : 1	22	1.7 : 1	27.7 : 1

Gibson. Goldenson, Kost, Performance Results of CMMI®-Based Process Improvement, CMU/SEI-2006-TR-004

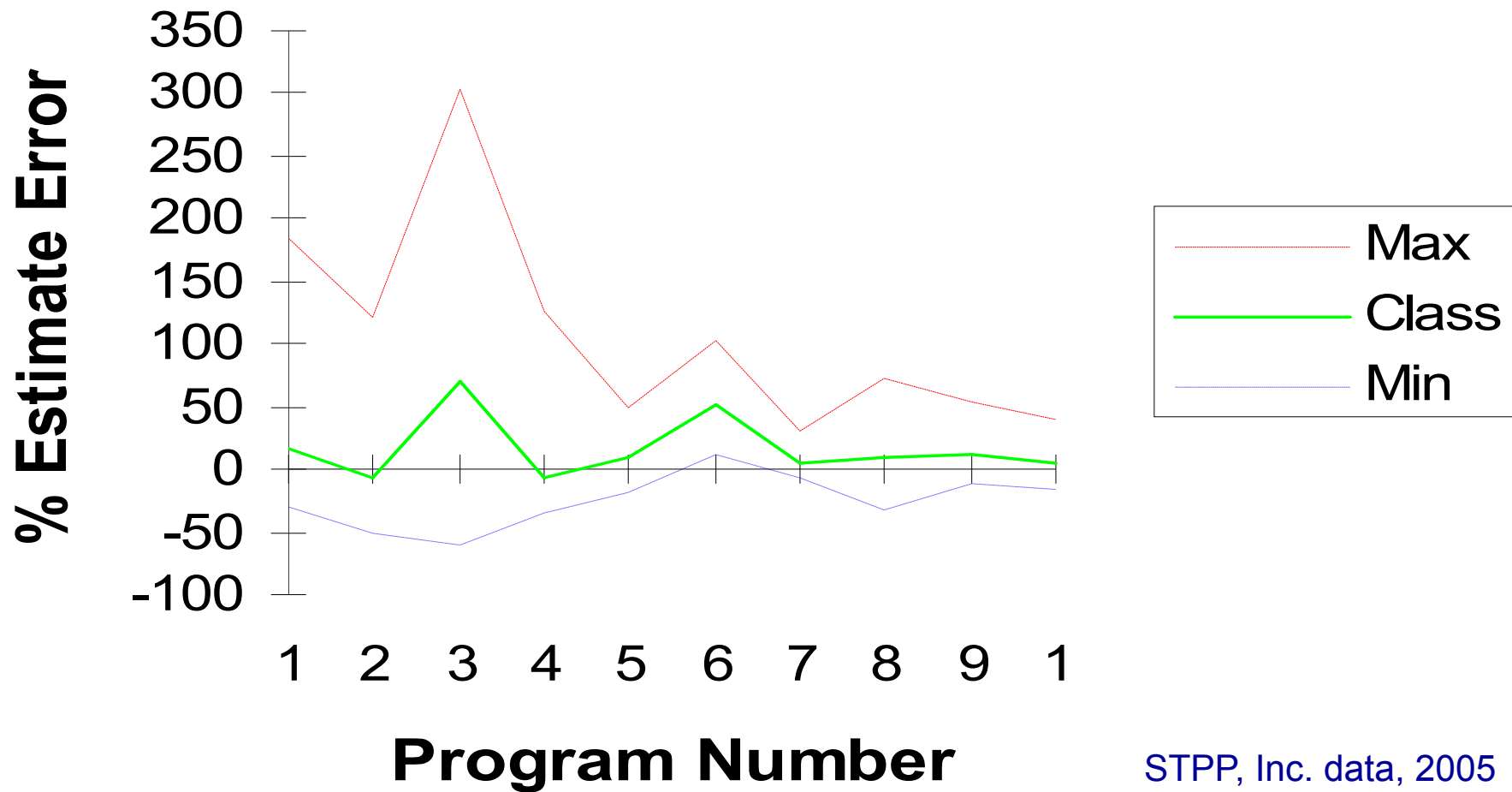
# What's a PSP?



- 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 (size, time, defects)
- Self management based on **individual metrics**
- Fostering commitment to quality principles
- It is a **level 5 process for individuals**

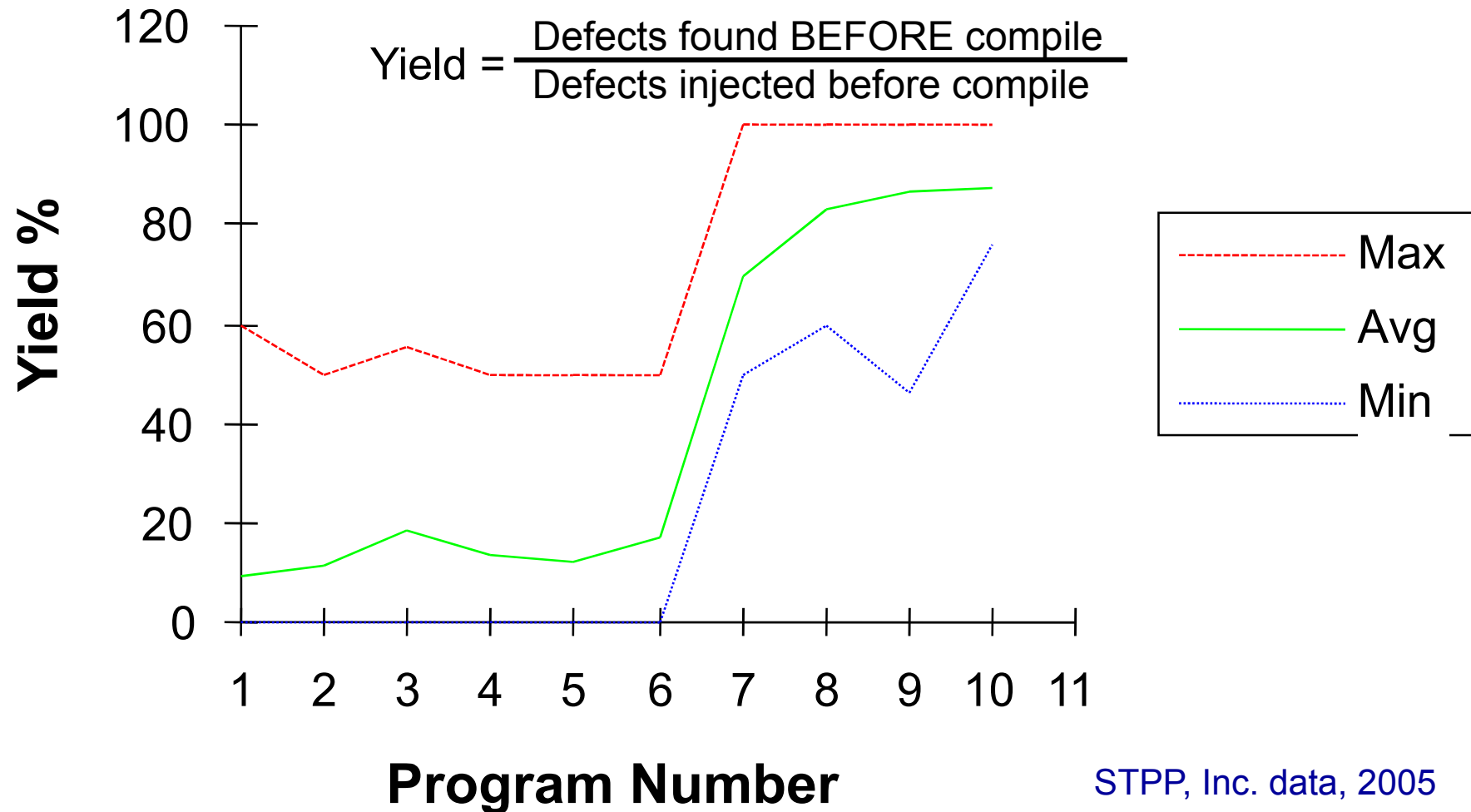


# Time Estimating Accuracy - % Error



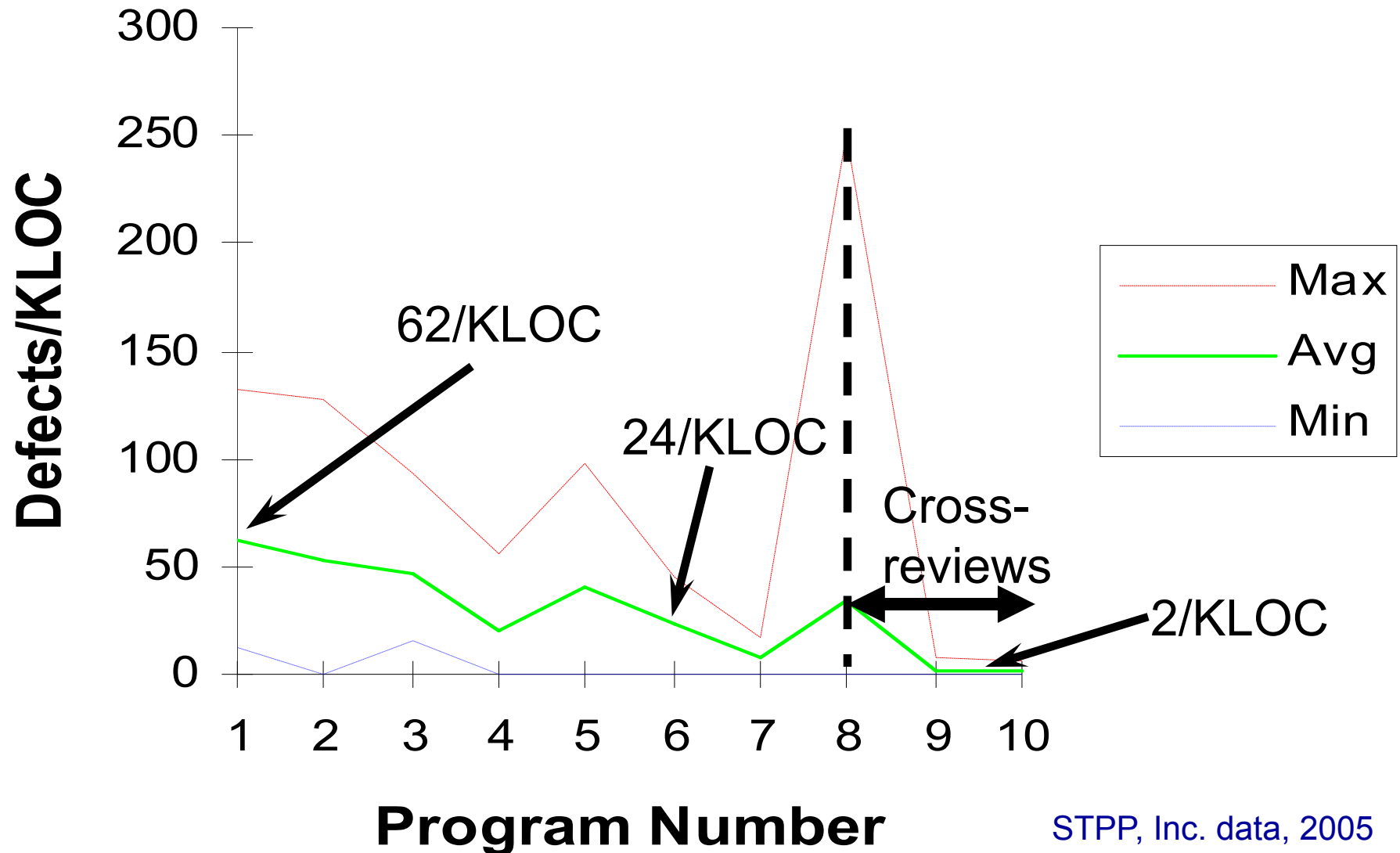
STPP, Inc. data, 2005

# Yield - All Students, All Programs



STPP, Inc. data, 2005

# Defects Found in Test - Range



# PSP ROI



The following table shows projected integration and system test (I&S) rework costs per KLOC for engineers before and after PSP training.

	Before PSP	After PSP
Defects/KLOC into Unit Test	62	2
Yield for Unit Test	50%	50%
Defects/KLOC into I&S Test	31	1
I&S Defect fix time/KLOC	310	10

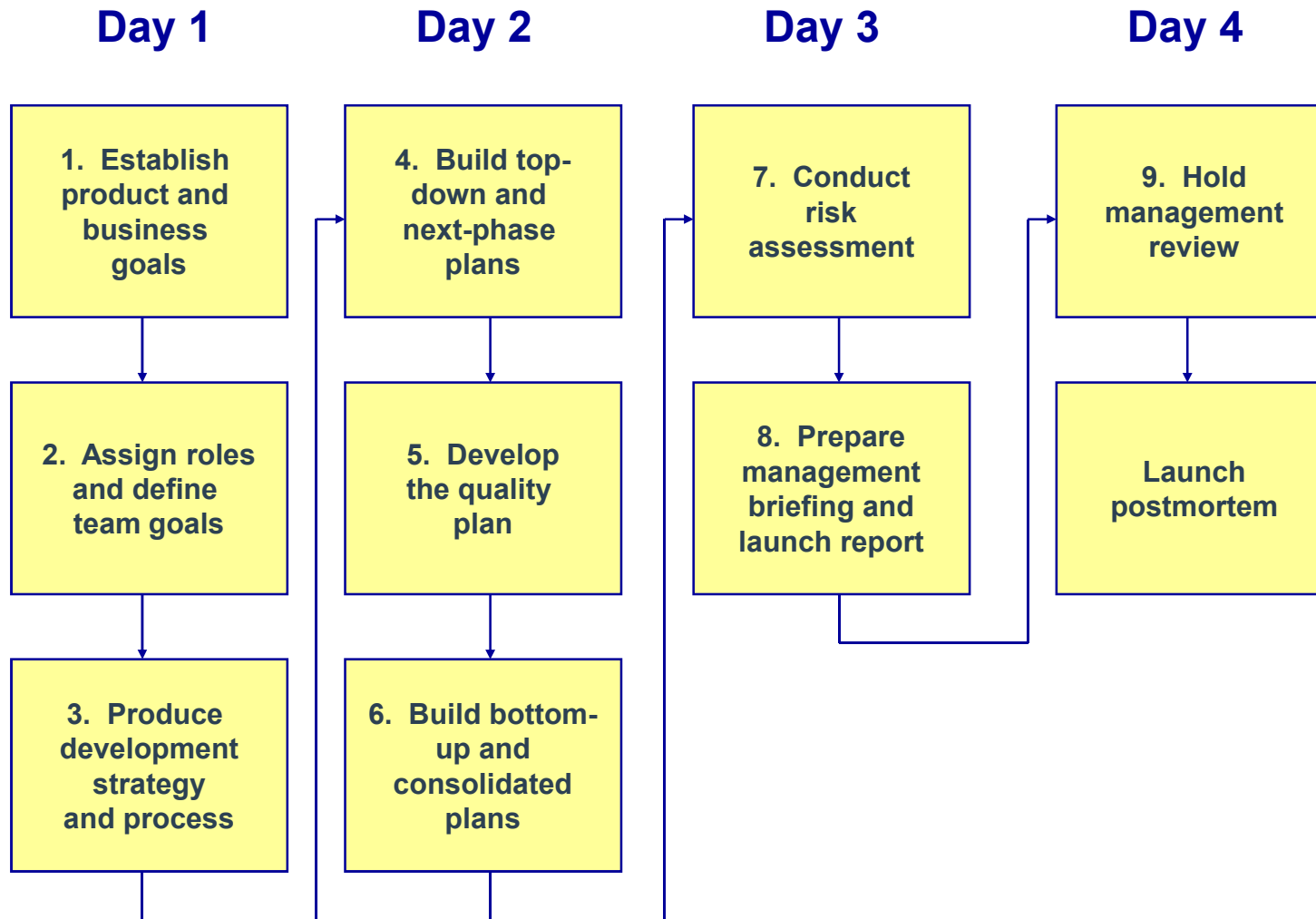
Integration and system test rework savings are 300 hours per KLOC (training **costs recovered in 4 weeks** of work!)

# What's a TSP?

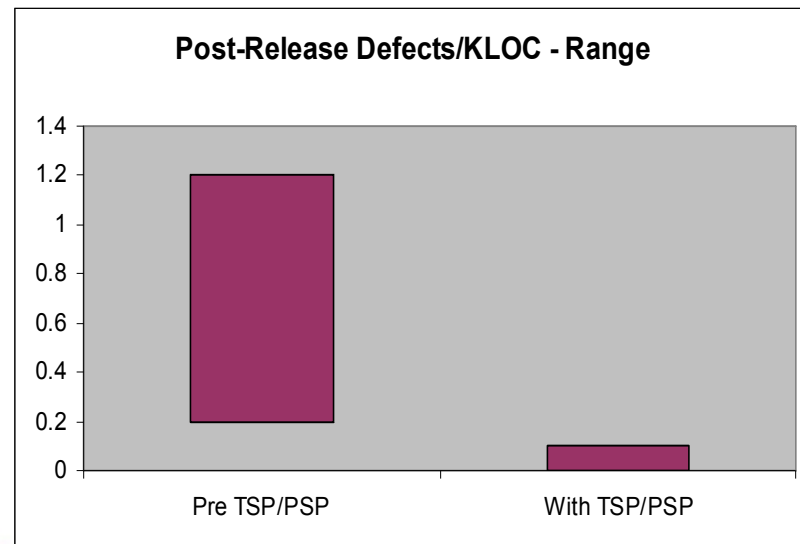
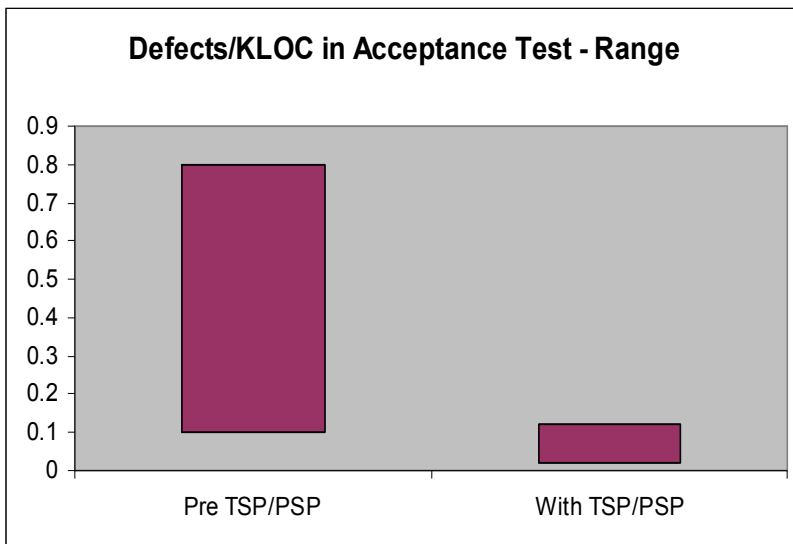
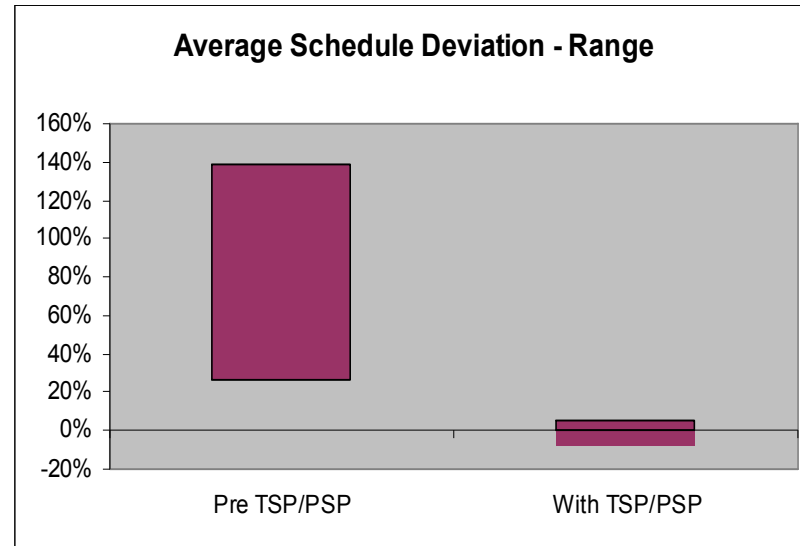
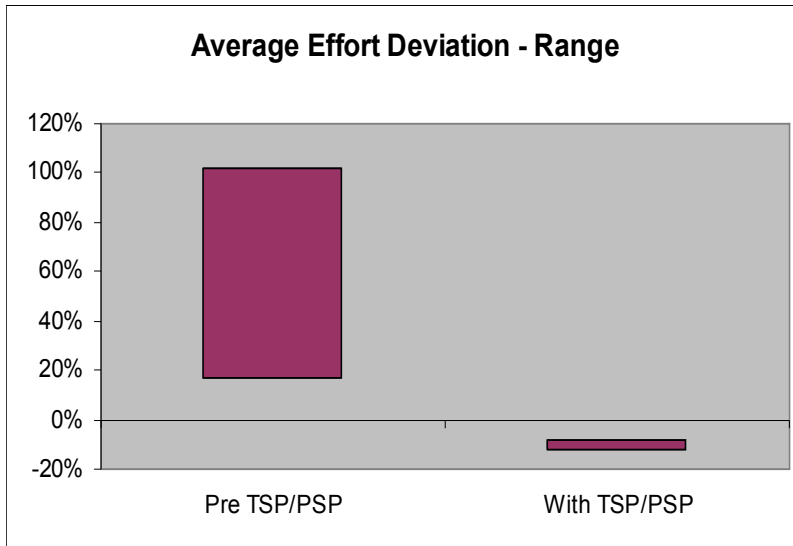


- The Team Software Process uses the PSP principles to
  - Apply the PSP sound **engineering discipline** to project work
  - Form and help perform **outstanding** self directed **teams**
  - Produce an aggressive but **realistic plan** own by the team
  - Proactively track project progress against the plan
  - Continuously measure and **improve the processes**
  - To produce world class products
- The TSP **accelerates CMMI** process maturation
- The TSP is a **level 5 process for small teams**
- The TSP starts with a project “launch”

# What's a launch?



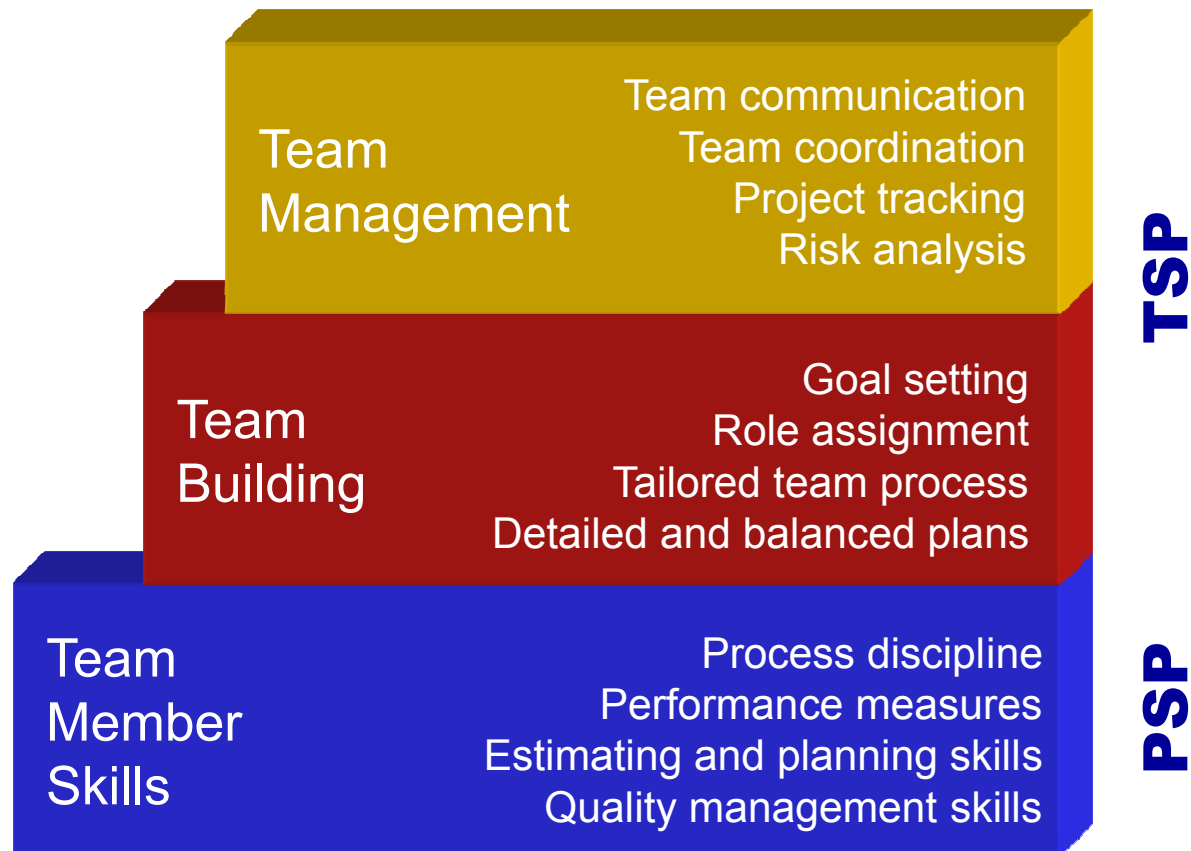
# Impact of PSP/TSP



# Building High-Performance Teams



- The TSP strategy is to improve performance from the bottom up.
- This strategy starts with PSP training.



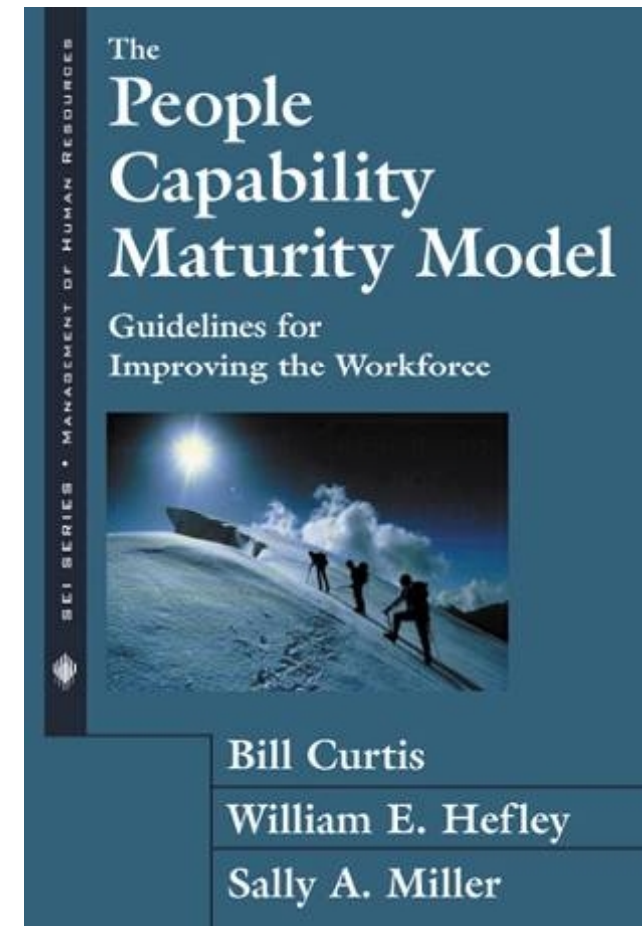


# What's a P-CMM ?



An organizational change model based on state-of-the-art workforce practices to help organizations:

- Develop workforce required to execute business strategy
- Characterize maturity of workforce practices
- Set priorities for improving workforce capability
- Integrate improvements in process and workforce
- Become an employer of choice



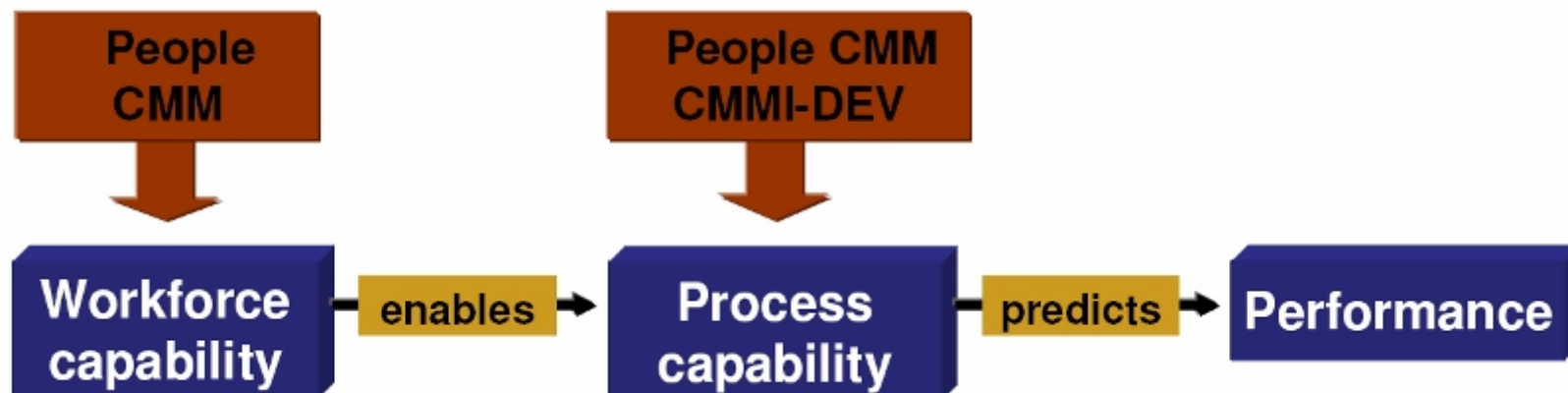
Curtis, Hefley, & Miller (2001)

# A process enabler



The primary objective of the People CMM is to improve the **capability** of an organization's workforce.

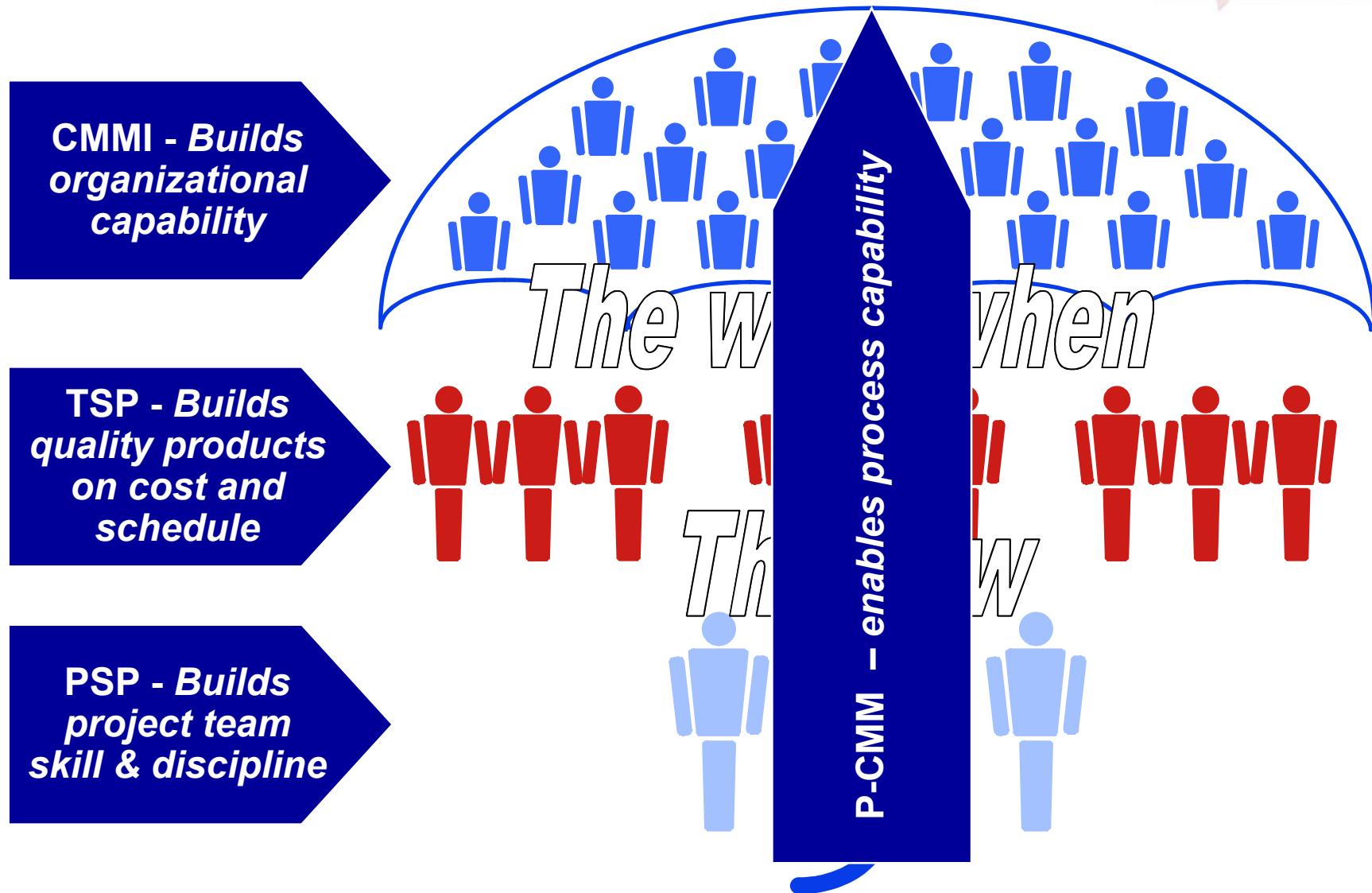
**Capability** is defined as the level of **knowledge**, **skills**, and **process abilities** available within each competency of the organization to build its products or deliver its services.



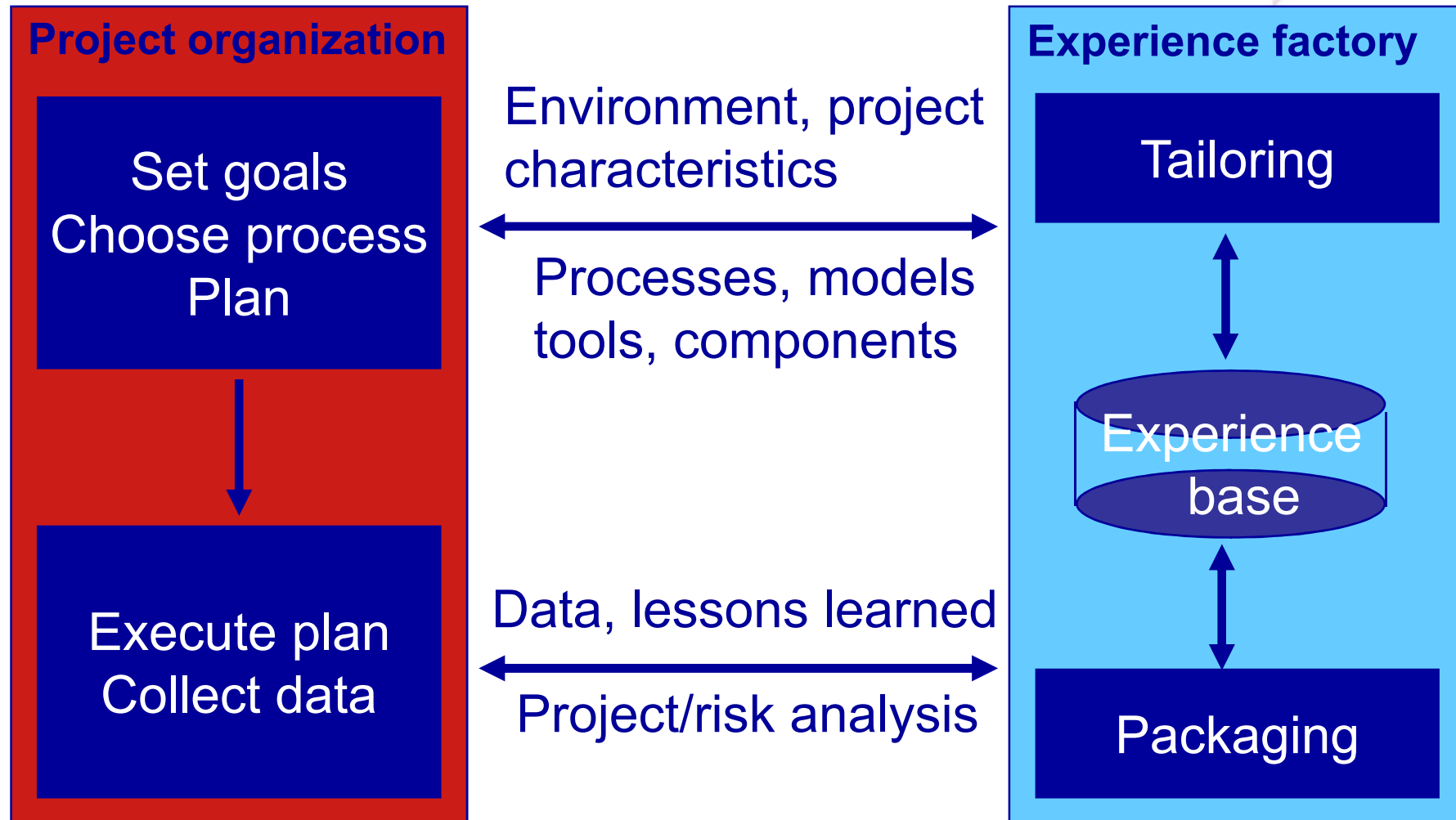
Level of knowledge and skills and process abilities in the organization

The range of expected results that can be achieved by consistently following a process

# Process synergy

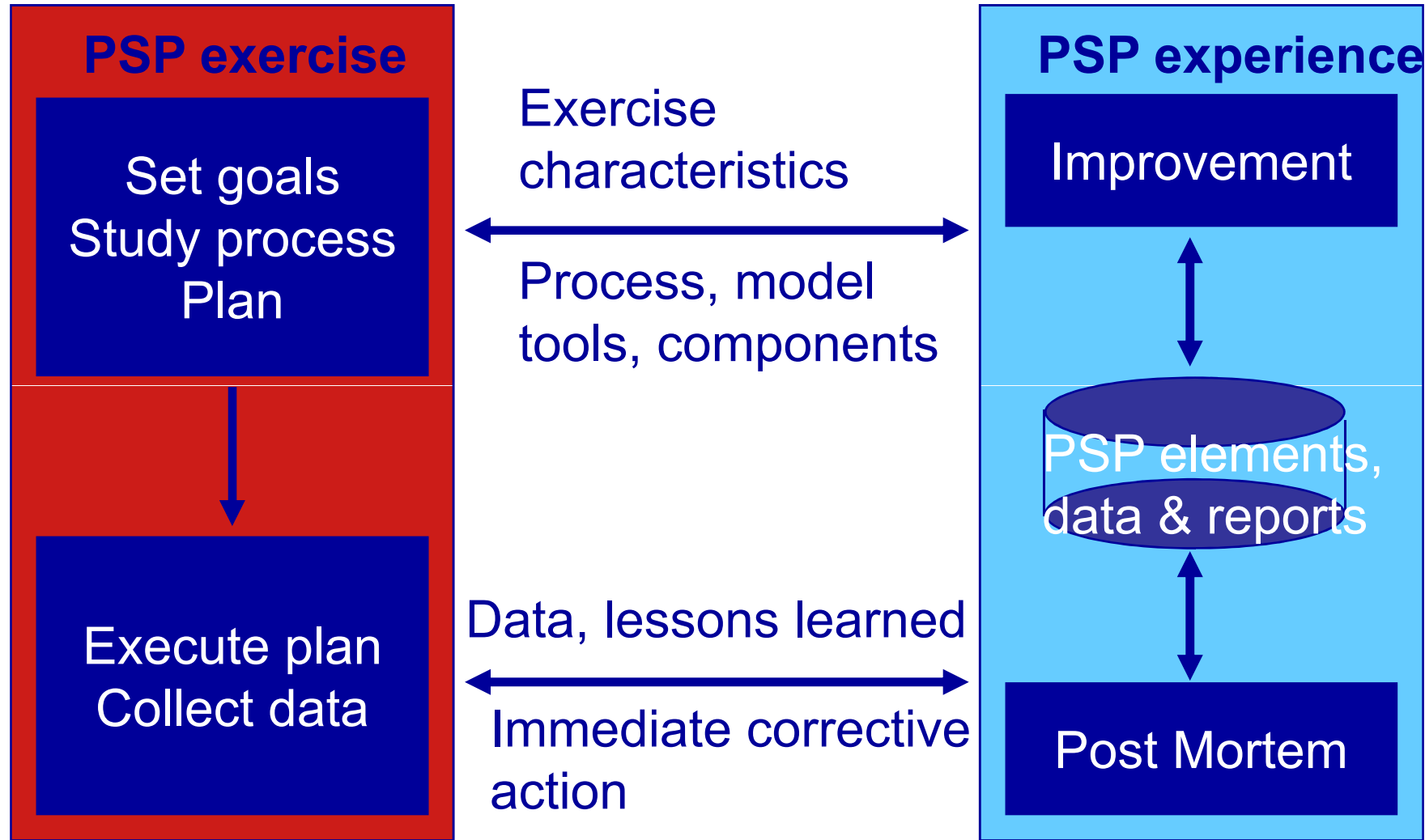


# SEL: The experience factory



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

# PSP: The experience factory of one



# Synergistic conditions



Leadership Skills Incentives Resources Plan

Outcome



Improvement

Adapted from the SEI class: Managing the technological change

# Conditions for success



Leadership Skills Incentives Resources Plan

Outcome



Confusion



Anxiety



Slow change



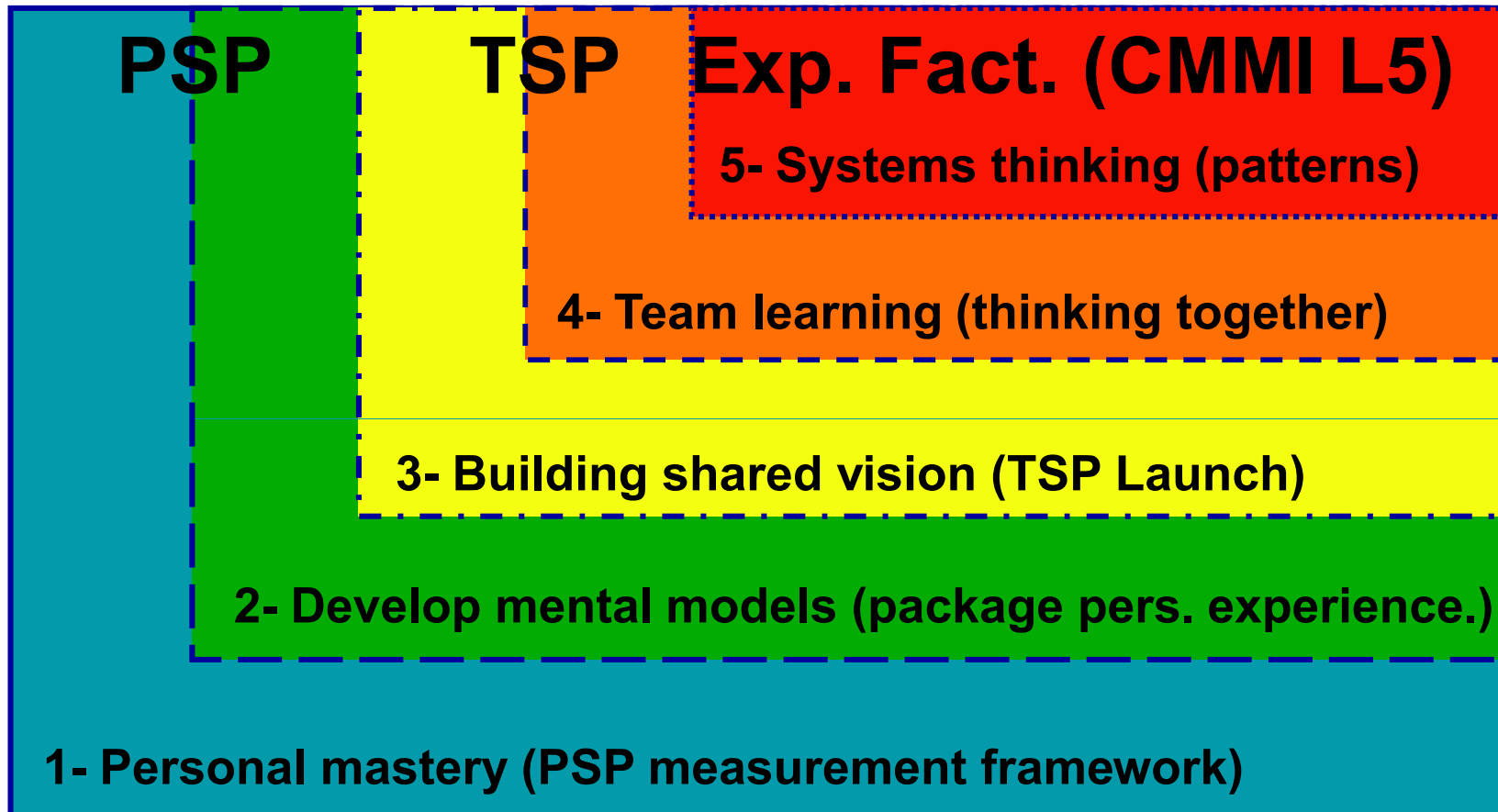
Frustration



False starts

Adapted from the SEI class: Managing the technological change

# The fifth synergy



See Peter Senge. 1990. *The Fifth Discipline*. NY: Doubleday-Currency



# The market



- IT global market expected to grow from US\$340B in 2005 to US\$1.1T by 2010
- Global sourcing expected to grow from US\$27B to US\$165B in the same time frame
- India fills up 28% of all IT global sourcing jobs (4% now for Mexico – rank 9<sup>th</sup> in the world)
- China, Russia, the Philippines, Turkey, Thailand, Poland and Brazil compete aggressively in this market

Source: Yvette Garcia, TSP symposium keynote, September 2008

# The main competition: India-1

- Over 600 software companies
- 2 Million graduates per year out of 7,000 colleges and 650 Universities

## Squeeze your metrics!

*“Dear customer,  
Our costs are within 5% of plan 95% of the time.  
Our schedules are within 2% of plan 95% of the time.  
Our error rate in the field is less than 100 defects/MLOC allowing us to guarantee each LOC we write. Work with us!”*

- What should be done?

# The main competition: India-2

- IT and IT Enabled Services (ITES)
  - Employ more than 2.2M directly, 6M indirectly or 28% of the world IT population (4% for Mexico \*)
  - Are expected to create 200k jobs in 2006 (65k in 2008 for Mexico \*)
  - Grow 28% a year (revenues growing at 32%/y)
  - Exports represent 25% of total exports
  - Accounts for 7% of GDP (2.3% in 2014 for Mexico \*)
- However, BPO (help desk) still represent 57% of IT/ITES jobs

\* Yvette Garcia, TSP symposium keynote, September 2008

# The view from India



# The Mexican strategy



## Background

Mexican national objective: become the world's highest quality software supplier by 2013.

The Mexican strategy

- Established Prosoft initiative
- Formed partnership with
  - Federal and state governments
  - Tec de Monterrey University
  - SEI
- Using TSP to guide and certify the work
- Using TSP to accelerate CMMI introduction



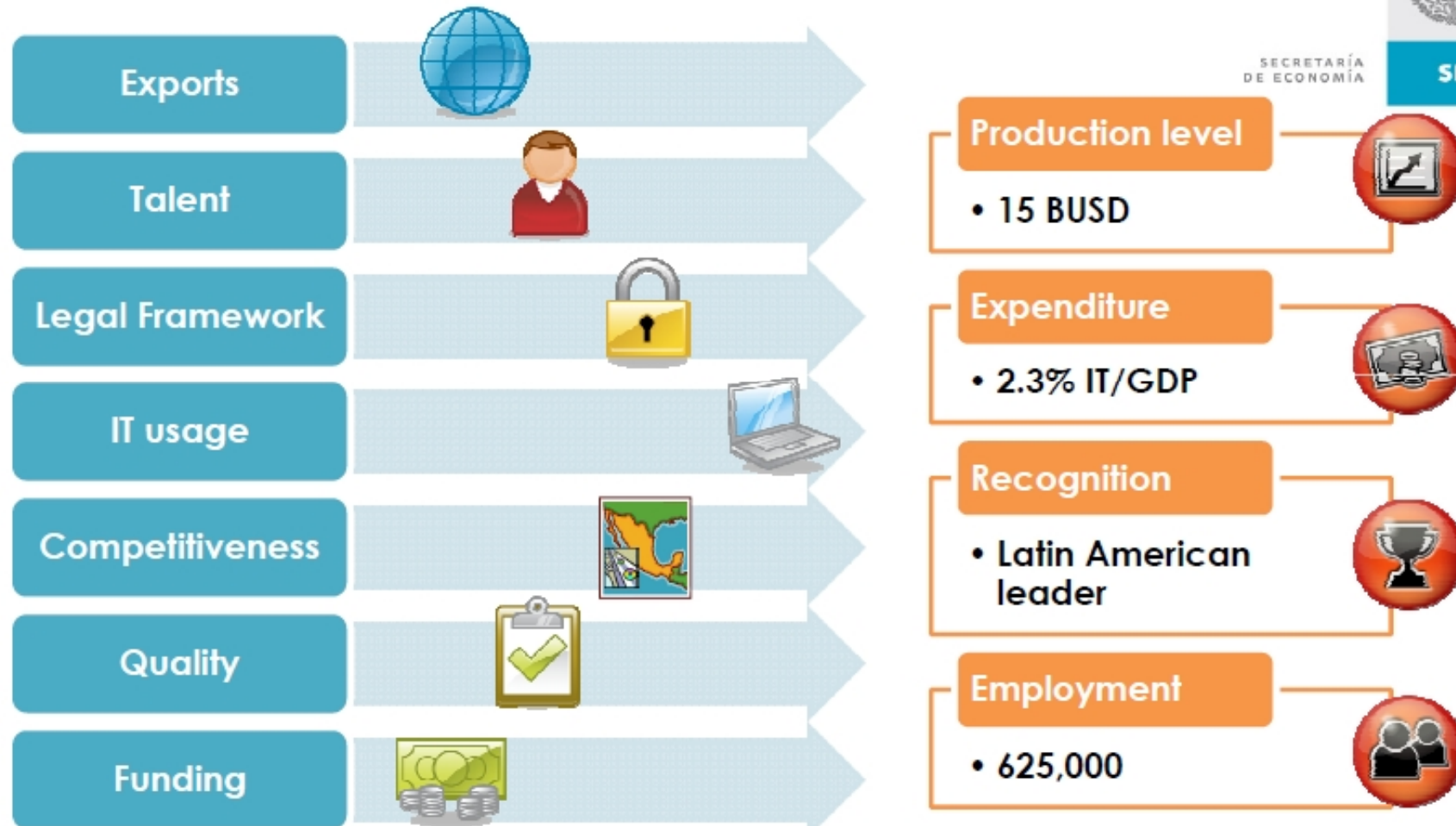
Humphrey, Nichols, Certifying Software organizations  
TSP symposium, September 2008

# PROSOFT 2.0 – Strategies and Goals 2013



SECRETARÍA DE ECONOMÍA

SE



150,000 people PSP trained & certified by 2013



# Conclusiones

Humble recommendations for Mexico

# Recommendations-1



- Create an Info Tenoch institute
  - Implementing the concepts of experience factory
    - Partnerships of industry / business and tech academia / Government for
      - Individual learning through PSP
      - Team performance improvement through TSP
      - Organization process improvement through CMMI
      - Increased competitiveness through lessons learned, models and tools
    - Web linked centers of excellence (IT Wikipedia in Spanish)
  - Emphasizing what already works, collecting and sharing data
  - Advising states and federal Governments
  - Facilitating the expansion of IT education
    - Academic cooperation for curriculum development
    - Encouraging coops, internships and 2 way sabbaticals
  - Nurturing entrepreneurship for an independent Mexican IT industry (including consulting)
  - Without forgetting psychological and cultural factors

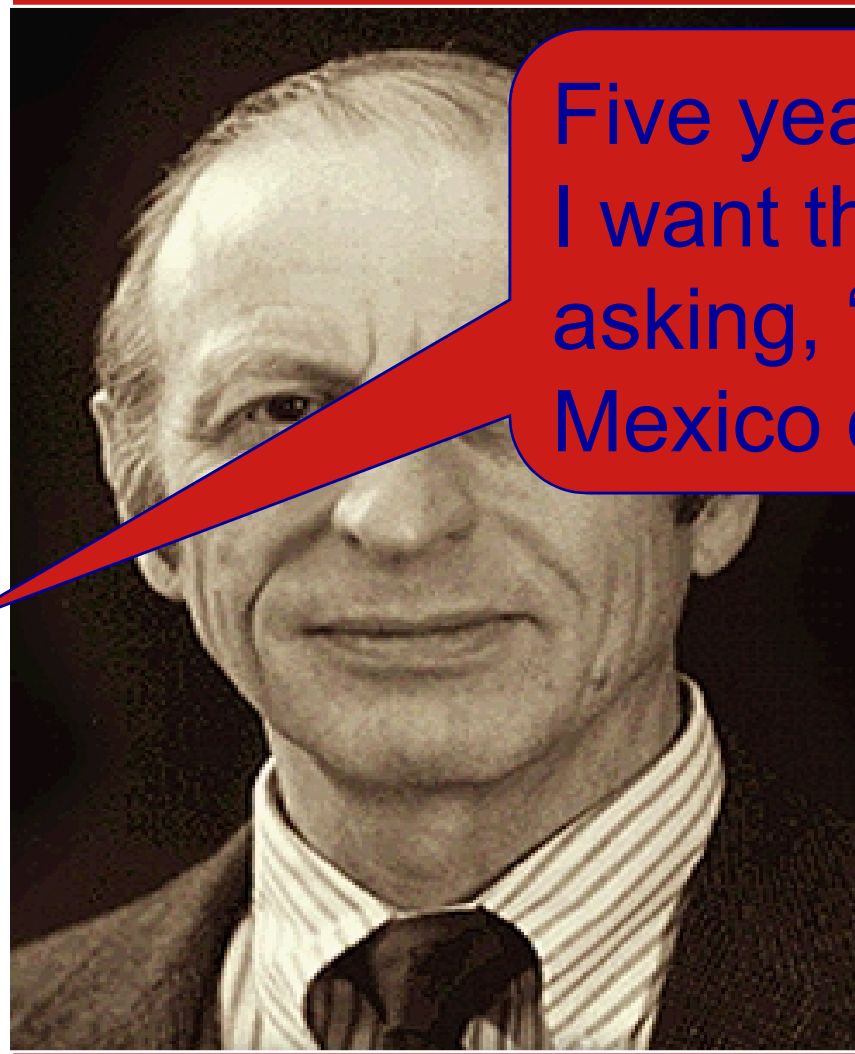


# Recommendations-2



- Expand PROSOFT to plan, finance, track and celebrate the results of solid, long term business based IT programs within partnerships
  - Applied to E-government and E-commerce
  - Including but not exclusively based on SEI material
    - Agile methods
    - Model based systems engineering
    - Domain engineering and meta programming
  - Placing quantitative results over maturity level
  - Fostering moving up the food chain
  - Visibly rewarding companies and individuals for verified achievements
  - Seed and lead, but then, get out of the way!
- And to all of us: **Let's squeeze our metrics!**

# The last word



Five years from now,  
I want the world to be  
asking, “How did  
Mexico do it?”

# ¿Preguntas?





# Gracias

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