

# Ten Years with TSP<sup>SM</sup>: A Retrospective and a Path Forward

presented at the  
2010 TSP Symposium  
Pittsburgh, PA

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September 21, 2010

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# Our Background

# Davis Systems

- Established in 1993 to provide software process improvement services.
- An SEI Partner for the Personal Software Process<sup>SM</sup> (PSP<sup>SM</sup>), Team Software Process<sup>SM</sup> (TSP<sup>SM</sup>), Capability Maturity Model Integration<sup>®</sup> (CMMI<sup>®</sup>), and SCAMPI<sup>SM</sup> services.
- We have trained thousands of professionals and worked with hundreds of projects in dozens of organizations.

# Darryl Davis, Principal

- Davis Systems' founder with over 27 years of software industry experience.
- Previously a Senior Technical Manager at Intergraph Corporation and a senior Engineering Systems and Programming Analyst at Chrysler Corporation.
- SEI Certified TSP Coach, PSP Developer, and Authorized PSP Instructor.
- Served for 13 years as an SEI Authorized Lead Appraiser.
- Served as an SEI Authorized CMMI Instructor.
- PMI Certified Project Management Professional
- MS, Computer Science major, Project Management minor; Bachelor of Computer Engineering.

# Noopur Davis, Principal

- Over 26 years in the software industry.
- Previously a Director of Engineering at Intergraph Corporation and a senior Engineering Systems and Programming Analyst at Chrysler.
- SEI Certified TSP Mentor Coach, TSP Coach, PSP Developer, and Authorized PSP Instructor.
- An SEI Visiting Scientist and former SEI Senior Member of the Technical Staff
  - Served 5 years full-time on the TSP team.
  - Continuing to support their Security & Survivability program (CERT®)
- Certified Scrum Master, Scrum Product Owner, Scrum Practitioner, and Scrum Developer.
- MS, Computer Science; Bachelor of Electrical Engineering.

# A Retrospective



# Life Before TSP

- Prior to the SEI's work, software industry best practices were scattered in research and practice, not integrated into a framework.
- Then Watt Humphrey's process maturity framework and book *Managing the Software Process* established structure and relationships around best practices and provided practical guidance for implementation and strategic improvement.
- Next, the CMM for Software provided elaboration of the framework and practices, and the assessment methods helped organizations understand where they stood and what practices they needed to implement.
- However, organizations struggled with how to implement the recommended practices. While many gradually succeeded with their implementations, many others built unnecessary bureaucracies and had mediocre results.
- We did not have good sharable examples of operational processes to show to organizations that were struggling to get started.



# The Start of Our TSP Journey

- 1995: Heard Watts speak about PSP.
- 1995: PSP self-study.
- 1996: First PSP project.
- 1997: Attended PSP training.
- 1998: Taught first PSP class.
- 1998: First PSP project after training.

# The Journey Continues

- 1999: Attended a TSP tutorial by Watts and Jim Over.
- 2000: First TSP project.
- Ten plus years, thousands of students, and hundreds of projects later, the journey continues.

# Early TSP Experiences

- Focused on launch.
- Developer-only teams.
- Requirements → High Level Design → Implementation.
- Longer cycles.
- Two-week developer training.

# The Ups and Downs

- Great results
  - Low schedule deviation.
  - System test defect densities  $< 1$  defect/KLOC.
  - Several teams had zero defects post system test.
  - Everyone loved launches.
- Yet...
  - Difficult to sustain discipline.
  - Two-week developer training barrier.
  - Tool support insufficient.
  - Seldom spread much beyond pilots.

# Positive Refinements

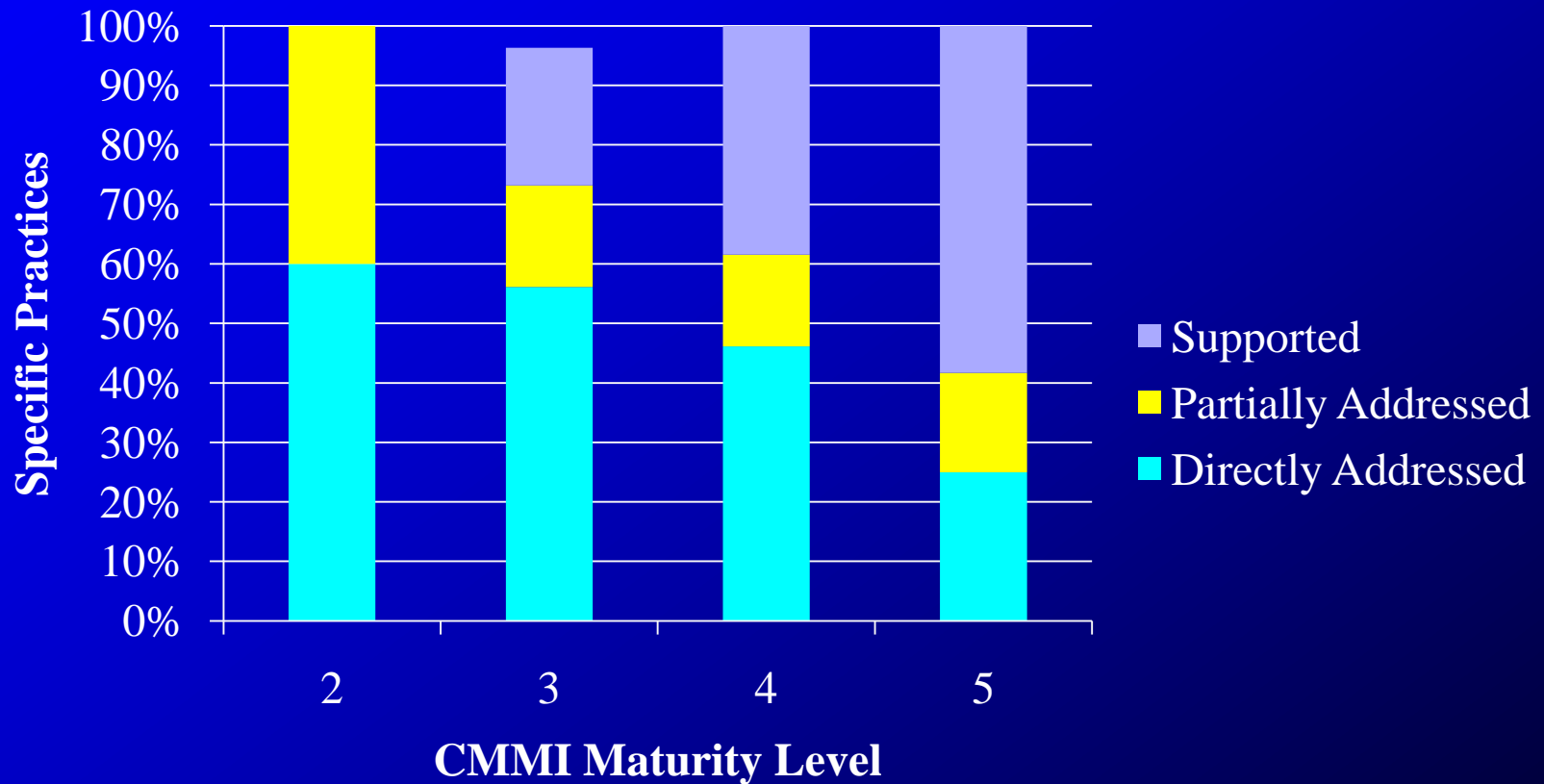
- Integrated product teams.
- Focus on incremental/iterative development.
- 1-week developer training before 1<sup>st</sup> launch.
- More tool choices/improved tools.
- Improved management training.
- From “launch coach” to “coach.”
- Mentoring developing coaches.

# Current Challenges

- Sustained team and individual discipline.
- Loss of management support once the newness wears off.
- TSP vs. the organizational inertia.
- Capability and usability of tools.
- Experience and abilities of coaches and instructors.
- Agile methods a disruptive challenge?

# TSP Coverage of CMMI

(Based on data from [McHale05])





# TSP Innovations

- Formalized self-directed software teams.
- Structured coaching of the development teams.
- Role managers.
- A simple yet powerful measurement framework.
- Quality plans based on a defect filter model.
- Capture-recapture applied to software verification.
- A complete package combining an operational process with an implementation infrastructure.

# We've Seen the Results

- Example: Intuit QuickBooks 2007[Sartain08]
  - Reduced defects found in system test by 60% over the previous two releases.
  - Saved \$20M from the reduction in customer support calls.
  - “The smoothest release anyone can remember.”

# Recent TSP Results<sup>[Jones10]</sup>

Method	Defect Potentials	Defect Removal Efficiency	Efficiency Delivered Defects
CMMI level 1	6,000	78.69%	1,079
CMMI level 3	4,500	91.18%	302
Agile	4,800	92.30%	276
Extreme Programming	4,500	93.36%	209
Rational Unified Process	3,900	95.07%	145
CMMI level 5	3,000	95.95%	83
Team Software Process	2,700	96.79%	67

Defect data normalized to 1,000 function points (about 75,000 C++ logical code statements)

# A Path Forward

# Promoting the Results

- The innovations and results with TSP are fantastic. Let's spread the word to a larger audience.

# Making the Ties

- We know that TSP is an excellent implementation of CMMI practices and the best of the agile values and principles.
  - Let's continue to better leverage the CMMI. The CMMI-TSP mappings and the new TSP+ and AIM are helpful. Let's keep it up and spread the word more.
  - Let's find more ways to leverage agile.
- Let's keep active at relating the TSP to the best ideas, research, and standards.

# Opening Up

- Let's find ways to make the TSP more accessible.



# Continuously Improving

- Practical refinement
  - Continued tool improvements.
  - Continued improvements in course delivery.
  - Logistical refinements.
- Process analysis and improvement
  - Guided by our rich set of TSP data.
- Continued innovation

# Sustaining Deployments

- Let's go beyond the basic roll-out strategy to provide better guidance for long-term sustainment.
- Let's try to find other ways to help TSP be sustained and grow.

# Maintaining the Discipline

- Discipline is essential to high performance.
- Discipline works!
- Let's maintain the PSP-TSP emphasis on personal and team discipline to continue to distinguish TSP as a high-performing method.

# Thank You, Watts

- For your gifts to our profession. Your hard work, dedication, and constancy of purpose is an inspiration to us all.

# References

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