

# Combining TSP, CMMI, Project Management, and People Skills to Create Better Software



309th Software Maintenance Group



## Report Documentation Page

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# Outline

- Purpose of the Presentation
- Historical Perspective of CMMI and TSP Alignment
- Perspective of the Presenters
- Collected Data from Eight TSP Team Leads
- Conclusions and Summary



# Presentation Purpose 1

1. Examine the assumption that TSP and CMMI are well aligned<sup>1,2</sup>.



# Presentation Purpose 2

- Share practical information (data points and opinions) from eight teams who are working in a CMMI environment to see where they think CMMI and TSP are:
  - Complimentary
  - Conflicting



# Presentation Purpose 3

- Explore the enhancing effects of TSP on typical software project management practices.



# Presentation Purpose 4

- Explore how People Skills can further enhance TSP teams.



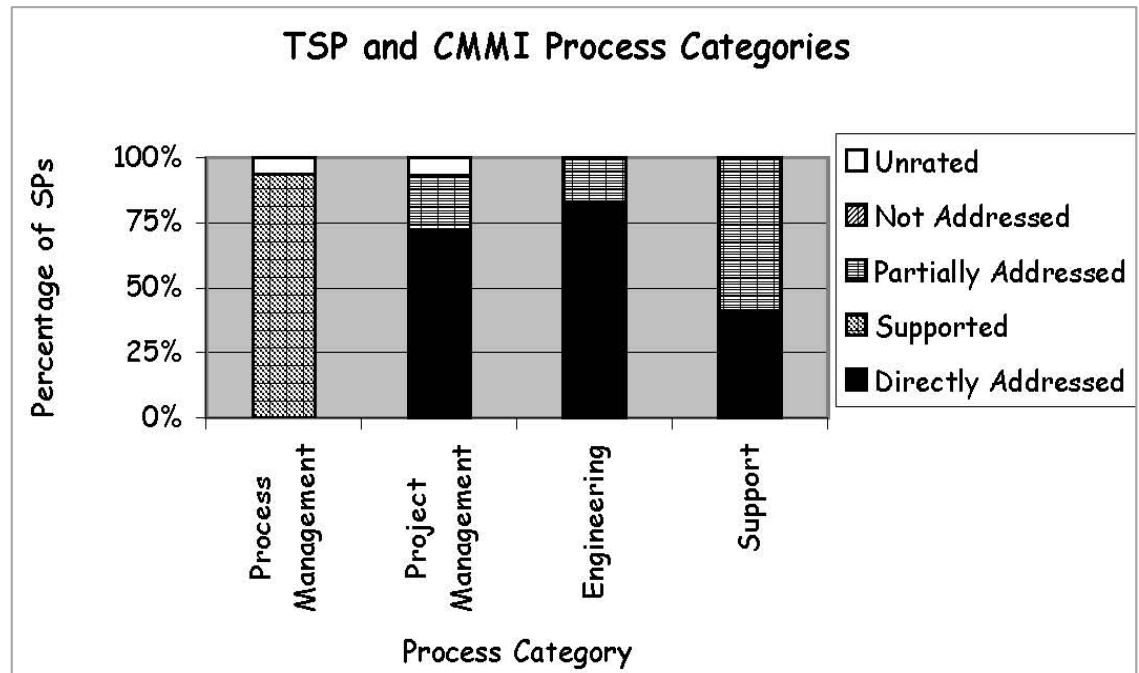
# Historical Perspective of CMMI and TSP Alignment





# 2005 SEI Report

- The report titled *Mapping TSP to CMMI* states, “It is becoming clear that by using TSP, organizations can greatly accelerate their CMMI process improvement work.”<sup>1</sup> (pg. 14)
- The report also states, “there are not yet any completed studies that document the acceleration achievable in CMMI process improvement through using the TSP.”<sup>1</sup> (pg12)



Summary of TSP Project Practice Coverage by Process Category  
(Source: *Mapping TSP to CMMI*, Fig 1.)

# Question Posed to Watts Humphrey

- **CROSSTALK:** Do you see issues between the model community (CMMI) and the process community (TSP) and, if so, what are your thoughts on how to overcome such differences?

# Watts' Response

“Frankly, I think in the past we have had differences, due to misunderstandings. We have been on separate paths. Fundamentally, one of the big problems they've (CMMI) got now is organizational performance with maturity. The CMMI community is beginning to see that what we've (TSP) got does work and so we are beginning to work together. CMMI and TSP are very complimentary. We are now working as a coordinated group to figure out how we can better coordinate these two approaches to help people accelerate their performance and process improvement.”

- CROSSTALK May/June Issue 2010

# Perspective of the Presenters



# From Our Perspective

- Presenters Perspectives:
  - Technical Director and TSP Launch Coach working intricately with multiple teams and guiding groups to incorporate process and technology.
  - Project Management consultant/coach working to incorporate PMBOK best practices and to build stronger communications and team building methodologies.
  - Extended Engineering Process Group member trying to mature teams to CMMI Level 5.

# Collected Data

Examining Information from Eight TSP Team Leads



# *1. What specific areas of CMMI and TSP work well in combination and why?*

- Engineering PAs, Project Management PAs, and several Support PAs.
  - Project Planning
    - Utilization of historic data
    - Stakeholder meetings (launch meetings 1-9)
    - Team and Stakeholder Agreements (launch meeting 9)
  - Project Tracking
    - Aggregated data from individuals
    - Earned value granularity (one week segments)
    - Real-time rebalance
  - Quality Focus
    - Quality Manager (launch meeting 2)
    - Quality Plan (launch meeting 5)
    - Quality Reporting (weekly)
    - Individual quality tasks



*Team Lead Quotes in Reference to Question 1.*

- “The measurement PA (MA) is also greatly enhanced by TSP because the TSP teams have a common framework and experience for defining and using measures.”
- “The Causal Analysis and Resolution is also a good fit with TSP because TSP teams regularly practice quantitative post mortems.”



## *2. What areas of CMMI and TSP conflict in combination and why?*

- Process Management PAs
  - CMMI defines Quantitative Project Management differently than do TSP teams.
  - Organizational Process Performance
    - Organizations usually have a mix of TSP and non-TSP teams
    - TSP tracks process as a single unit (launch to postmortem)
    - What is useful for TSP may not be for others
      - Time on task
    - Roll-up data may not match
  - Note: Although not a perfect fit, TSP teams collect enough data to make the model work, but aligning the models can be difficult.



*Team Lead Quotes in Reference to Question 2.*

- “CMMI has almost a top down command hierarchy assumption (e.g., the inclusion of a policy requirement in all PAs), whereas TSP is very much of a bottom up approach.”
- “CMMI assumes discipline is enforced from above whereas TSP assumes that discipline is internally driven.”
- “Organizational Innovation and Development is done at a higher level in CMMI than in TSP.”

*3. How are project management functions  
(planning, scheduling, estimating, and tracking)  
affected by TSP disciplines?*

1. Initial, robust TSP planning (launch meeting 1)
  - Requirements, strategy, estimates, and schedules
    - No work until there is a concurrence from management and customers regarding the areas above.
  - Weekly TSP Team meeting is real-time tracking tool
    - Schedule performance
    - Achievement of planned hours (EVM)
    - Re-evaluation of estimates
    - Workload re-balance (resource loading)
    - Risk management (probability and impact)
    - Re-planning (estimates, assignments, approval)



## *Team Lead Quotes in Reference to Question 3.*

- “Assuming you use TSP Dashboard, it assists in re-planning when change occurs.”
- “Because everyone on the team has a personal plan and collects personal data which they then share with the team, the team’s weekly meeting becomes a critical real time project management tool.”
- “These functions (PM) are the very core of TSP.”

## 4. How have People Skills further enhance your TSP projects?

- TSP *intensity* requires a high level of communication
- Team building
  - Recognizing people (team can overshadow the individual)
  - Managing team dynamics
  - Reduce finger pointing
  - Rebalancing workload (fine balance)
  - Mentoring
- Removing barriers (political)
- Redirecting focus to quality not schedule



## *Team Lead Quotes in Reference to Question 4.*

- “Soft skills are the most important skill a TSP leader can have.”
- “Communication - teams have to have a clear focus of what their management expects of them and then the team meetings need to track those goals.”
- “The team leader also has to know the abilities, strengths, weaknesses, etc. of the team and manage to those as well.”

*Ancillary comments from the collected data?*

- “A careful analysis must be done to correlate each activity dictated in CMMI and TSP. Our team created a mapping to ensure this happens, because it doesn’t happen naturally.”
- “Examine team dynamics; counsel, discipline and even remove those who are disrupting, abusing or ignoring other members. This is one of the most difficult soft skills, because the most disruptive people are sometimes the high performers.”

# Summary and Conclusion





# Summary

- Many TSP practices lend themselves to CMMI PAs (Engineering, Project Management, Support)
- CMMI drives top down and TSP drives bottom up
- Conflicting areas include:
  - Organizational Process Performance
  - Aligning data and reporting
- TSP can be the answer for lacking PM practices.
  - Through TSP, PM activities occur early and often
  - PM significantly enhanced by TSP practices
- Soft skills cannot be ignored and are essential if teams want to be successful.
  - Be careful, TSP can drive soft skills out of a team because of the focus on schedule and process.



# Conclusion

- Performing TSP in a CMMI environment produces the best results when the manager is focused on team dynamics and is well educated in reference to CMMI, TSP, and PM practices. The manager can then:
  - Make the correct alignments where misalignments occur
  - Obtain and utilize greater PM control
  - Manage and motivate team members for greater productivity and harmony.

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# Notes

1. McHale, James & Wall Daniel, *Mapping TSP to CMMI*, Software Engineering Institute, Pittsburgh, PA, 2005, CMU/SEI-2004-TR-014  
<<http://www.sei.cmu.edu/reports/04tr014.pdf> >
2. Koch, Alan S., TSP Can Be the Building Blocks for CMMI, CrossTalk, 2005  
<[www.stsc.hill.af.mil/crosstalk/2005/03/0503koch.html](http://www.stsc.hill.af.mil/crosstalk/2005/03/0503koch.html)>