The Next Step in Process Evolution: CMMI and TSP/PSP

Case Study of a CMMI Level 5 Organization

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Topics

- Transforming the world of software
  - CMMI, TSP, PSP
- CMMI implementation issues
- TSP/PSP practices
- CMM, TSP, PSP – AIS results
Transforming The World Of Software
Models Of Excellence

CMMI – Builds
organizational capability

TSP – Builds
quality products
on cost and schedule

PSP – Builds
individual skill
and discipline

Source: Software Engineering Institute
CMMI Implementation Issues

Developers execute at lower maturity levels than their organizations have achieved and advertised.

Assurance that new projects will incorporate CMMI processes.

High capability and maturity level ratings do not of themselves guarantee program success.


Failure to change root cause behavior that leads to programs that do not meet cost, schedule and performance expectations.


Adequate maturity at program initiation.
CMMI - Necessary, Not Sufficient

- No simple model could precisely measure process maturity and complex models are not useful in guiding improvement
- CMMI consciously focused on *what* organization should do, not on *how* they should do it
- The teamwork practices and personal disciplines required for quality software work are almost entirely issues of *how*, and not just *what*
- Because engineers will not change the way they work without very specific guidance, the CMMI does not change engineering behavior
CMMI Implementation Issues

TSP/PSP Practices - 1

- TSP teams require that individual team members must have successfully completed the two-week official SEI PSP for Engineers course.
- PSP trained engineers
  - make and follow detailed plans,
  - gather and use historical data,
  - measure and manage quality,
  - analyze and improve their processes.
- With the support of a SEI-authorized TSP coach, the TSP framework enables PSP trained developers to consistently follow these practices at the personal level, and ensure that the developers execute at the maturity level of the organization.
CMMI Implementation Issues
TSP/PSP Practices - 2

- TSP framework recognizes that only top management can motivate development teams to follow disciplined practices of the organization defined CMMI processes.
- In TSP, projects are initiated with the TSP launch process consisting of 9 scripted meetings led by an SEI-authorized coach.
- The coach and the team lead ensure that the team understands not only “what” management wants to accomplish in the project as well as the “how”, including the use of organization’s CMMI process.
CMMI Implementation Issues
TSP/PSP Practices - 3

- Team members make detailed plans utilizing historical data
- Follow documented estimating procedure
- Teams negotiate schedule and cost commitment based on the plan
- In weekly status meeting, teams track schedule progress using earned value management
- Team members measure and manage the quality of their work products
  - Early defect removal
  - Personal review yields
  - Highest quality product into test

High capability and maturity level ratings do not, of themselves, guarantee program success.
CMMI Implementation Issues
TSP/PSP Practices - 4

- When pressed for early deliveries, the responsible team members say:
  “I understand your requirements, I will do my utmost to meet it, but until I make a plan, I cannot responsibly commit to a date.”

- When pressed for early deliveries, the responsible managers say:
  “I trust you to create an aggressive and realistic plan, I will review the plan, but I will not commit you to a date that you cannot meet.”

Failure to change root cause behavior that leads to programs that do not meet cost, schedule and performance expectations.
CMMI Implementation Issues
TSP/PSP Practices - 5

- TSP teams ensure that at program initiation, sufficient time is devoted to getting consensus on development strategy and process.
- TSP teams make a detailed plan that is granular and facilitates tracking to detect one day schedule slip.
- The TSP launch process ensures a jelled team that takes ownership of the plan and the process.
CMM/TSP/PSP Results – Schedule

AIS

Schedule Deviation Individual Value Control Chart - Development Phases

>10 years history of delivering within 8% of committed schedule on average

Date of Project Phase Start

% Deviation

CMM

PSP/TSP

112%

37%

8%
CMM/TSP/PSP Results – Effort/Cost

AIS

Effort Deviation Individual Value Control Chart - Development Phases

>10 years history of delivering within 4% of committed effort/cost on average
Transforming The World Of Software Models Of Excellence

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PSP – Builds individual skill and discipline

Source: Software Engineering Institute