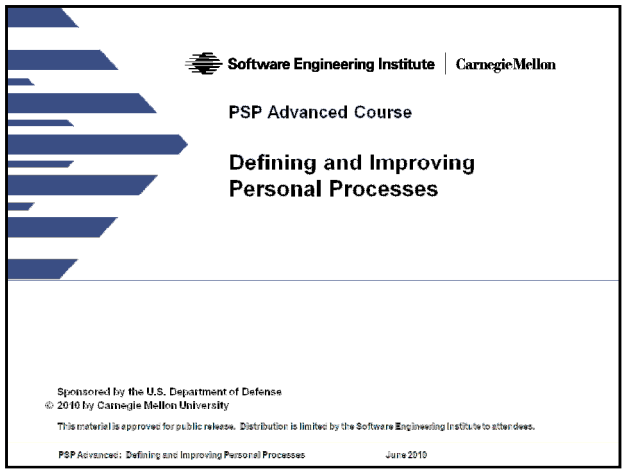
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PSP Advanced Course
Defining and Improving Personal Processes
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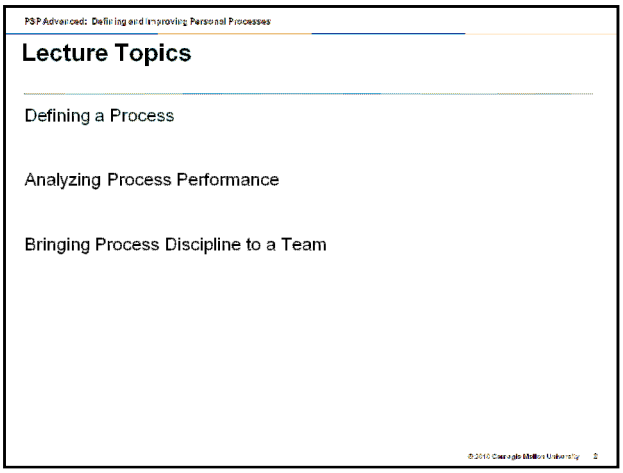
PSP Advanced: Defining and Improving Personal Processes
June 2010


PSP Advanced: Defining and Improving Personal Processes
Lecture Topics
Defining a Process
Analyzing Process Performance
Bringing Process Discipline to a Team
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Why Define and Use a Personal Process?

Why Define and Use a Personal Process?

Benefits of a personal process include

- consistency
  - results are more likely to be similar.
  - work becomes more predictable.
- efficiency
  - structures and guides your work (orders the steps, avoids rework)
  - keeps you focused on what needs to be done now
- basis for improvement
  - gathering data on your work helps determine which steps
    - take the most time
    - cause you the most trouble
    - are least effective
  - this information helps identify improvement opportunities

Elements of a Good Process Definition

Scripts Document the process entry criteria, phases/ steps, and exit criteria. The purpose is to provide expert-level guidance as you use the process.

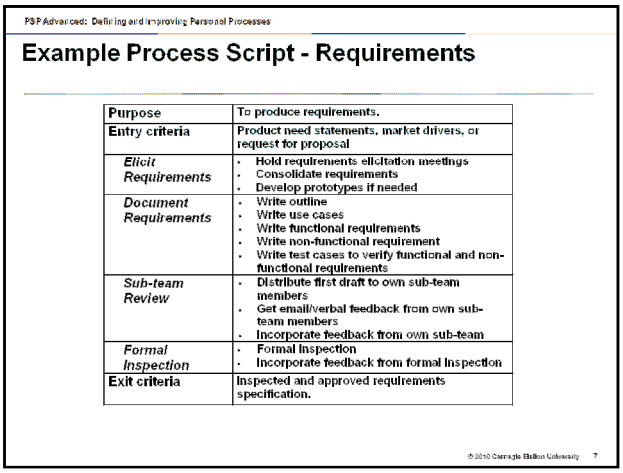
Measures Measure the process and the product. They provide insight into how the process is working and the status of the work.

Forms Provide a convenient and consistent framework for gathering and retaining data

Standards Provide consistent definitions that guide the work and gathering of data.

Example Process Script – Software Development

PSP8 Process Script		
Purpose		To guide the development of module-level programs
Entry Criteria		- Problem description - PSP0 Project Plan Summary form - Time and Defect Recording logs - Defect Type standard - Stopwatch (optional)
Step	**Activities**	**Description**
1	Planning	- Produce or obtain a requirements statement. - Estimate the required development time. - Enter the plan data in the Project Plan Summary form. - Complete the Time Recording log.
2	Development	- Design the program. - Implement the design. - Compile the program, and fix and log all defects found. - Test the program, and fix and log all defects found. - Complete the Time Recording log.
3	Postmortem	Complete the Project Plan Summary form with actual time, defect, and size data.
Exit Criteria		- A thoroughly tested program - Completed Project Plan Summary form with estimated and actual data - Completed Time and Defect Recording logs



Example of a script that is not part of PSP. Students need to begin thinking about what scripts they will need to perform on the job. This is a good lead into the Process Definition Exercise.

Basic Process Measures -1

The reason to measure a process is to understand it.

- how much time is spent in various activities
- what is produced at various times
- how many defects are injected and removed, and when

With these data, individuals can better

- plan and estimate the work to be done
- evaluate the results
- improve the process for the next project

Basic Process Measures -2

To measure the process, the work is divided into a defined set of tasks or activities called *phases*.

The measures for each phase are

- time spent in that phase
- defects injected in that phase
- defects removed in that phase

The product size is also measured, but only when the work package is complete. The size measure may very depending on product or sub-products.

These measures provide the foundation for all PSP and TSP measurements, analyses, and planning.

Core Measures

Size

Effort

Quality

Schedule

Source: CMU/SEI-92-TR-019

Example Size Measures

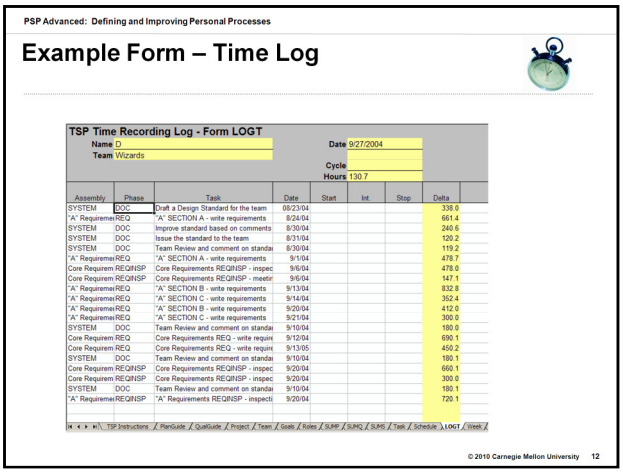
A good size measure must be:

- useful for planning (correlate to effort)
- precise (when two people measure the same thing, they get the same result)
- directly countable/measurable

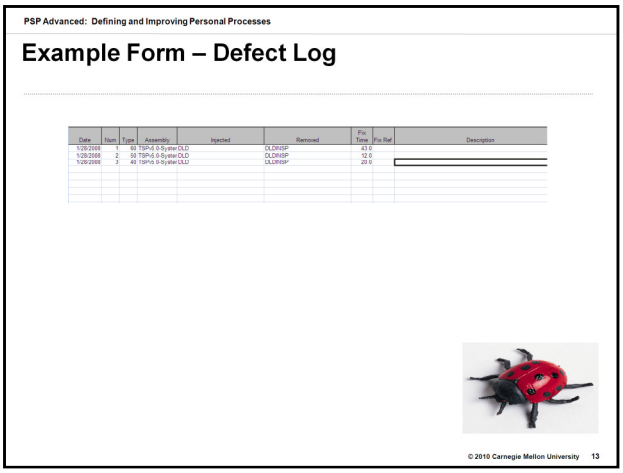
For example:

- pages
- paragraphs
- diagrams
- graphs
- lines of code
- requirement statements

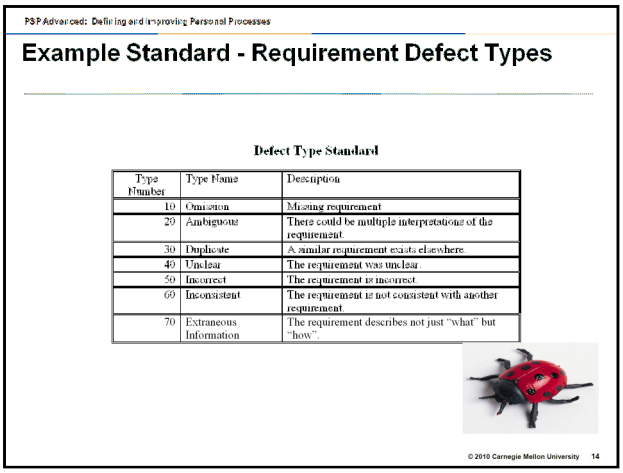
This is an example of size measures.



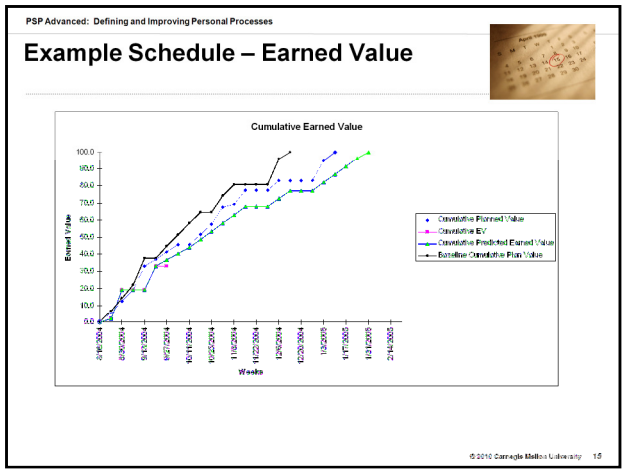
Example of time being measured.



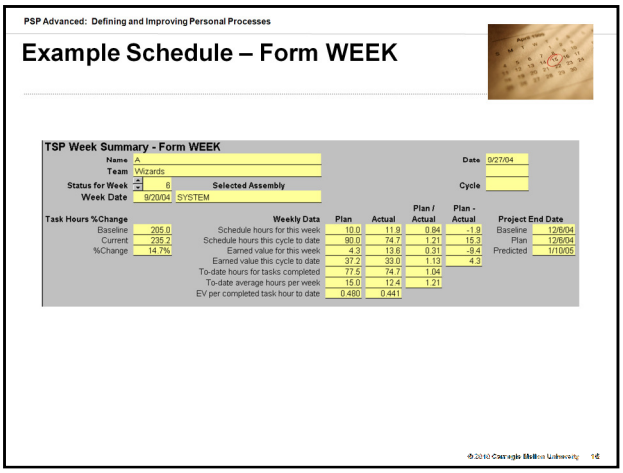
Example of defects being collected.



Example of a defect standard. Note that students will have to create many standards in order to collect relevant measures in the work environment. This is an example of a Requirement Defect Type Standard.



Earned Value one way to measure schedule performance.



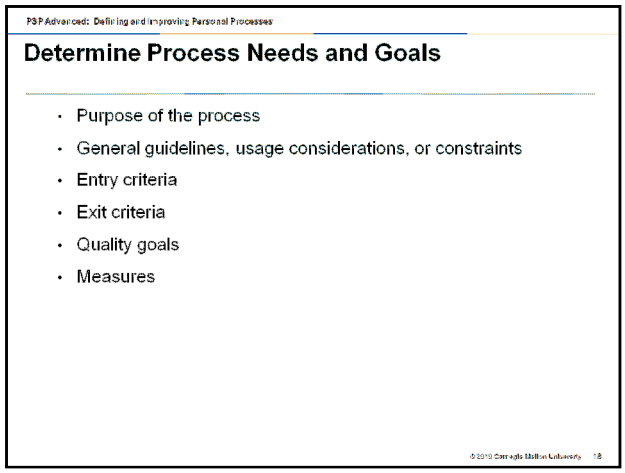
Plan versus actual schedule hours is another example of a schedule measurement.

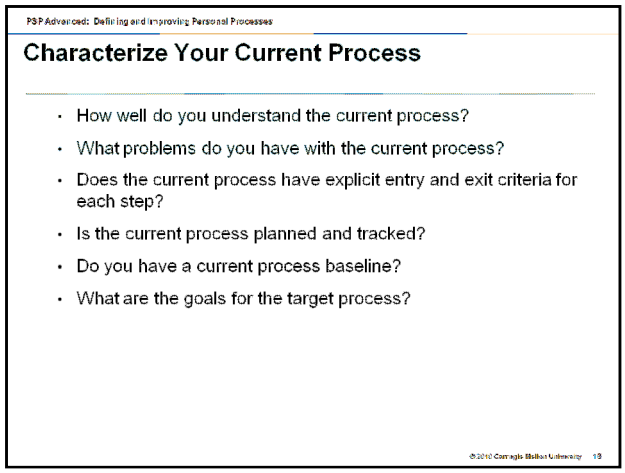
Process Development Steps

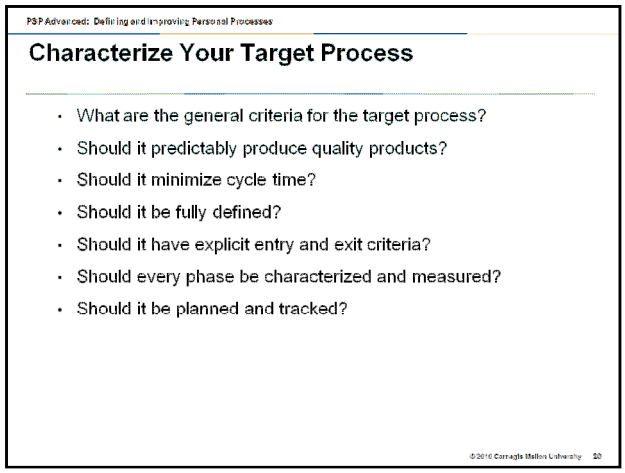
1. Determine your needs and priorities
2. Define the process objectives, goals, and quality criteria
3. Characterize your current process
4. Characterize your target process
5. Establish a process development strategy
6. Define your initial process
7. Validate your initial process
8. Enhance your process

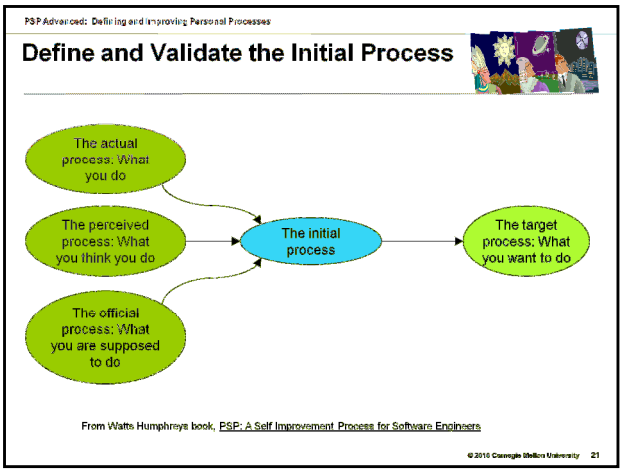
Note: Order the steps in the most appropriate order for your situation.

Based on chapter 13 of Watts Humphrey's PSP: A Self Improvement Process for Software Engineers.







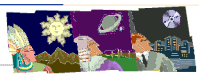


When you define the initial process, the objective should be that it represents your current processes and moves you in the direction of your target process.

Your first attempt will likely be close to your perceived process, what you think you do. When you try to use this process, you'll discover your actual process differs; the omissions, mistakes and oversights will standout.

You should adjust your process definition so that it more closely matches what you actually and try it again. After a few iterations, what you actually do and the defined process will converge to a realistic initial process. With this more disciplined and stable stating point, your process improvement efforts will be most successful.

Enhance the Process



1. Use the process and learn what is working and what needs to be improved
2. As you use the process, record your PIPs
3. Evaluate Ideas and determine potential performance gains
4. Select PIPs, plan, and implement them—add more detail as needed to your process
5. Do work and while doing the work collect
   - detailed data
   - generate PIPS
   - learn about new methods (and record those as PIPS)
6. Periodically do Big Picture Analysis
7. Record PIPS and problems–determine if it is time for another round of process improvements

Hints and Tips

Design the process at just the level you need to guide the work. Consider it an expert level checklist.

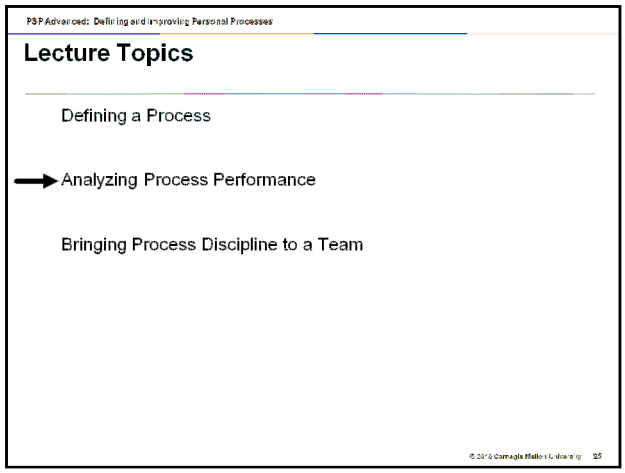
Your first pass will rarely be complete no matter how much time you put in it.

Start with a simple process and enhance it as you learn.

Process Evolution and Performance Improvement

As you do work, many things can lead you to want to evolve your process with goal of improving your performance:

- Aspiration (I want to do Better!)
- Inspiration (I had this great idea! Or I want to try this new thing I read about!)
- Annoyance (This problem happens all the time and it is a real irritant!)
- Performance Problems (I am not meeting my commitments 80% of the time!)



Analyzing Process Performance - 1

Discussion:

- Why do you need to periodically review your process data?
- How often should you review your process data?
- What happens if you review your process data too often? too seldom?

If you have already set goals, you start by understanding your performance against those goals.

Analyzing Process Performance - 2

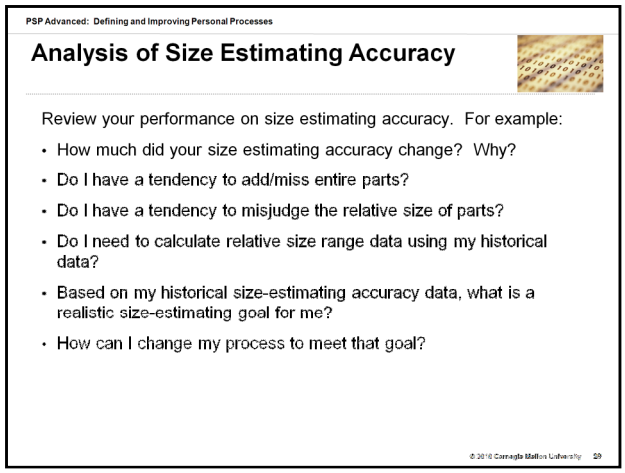
Analyze your performance with respect to size estimation, effort estimation, and quality management to:

- understand your current performance
- identify your highest-priority areas for improvement
- establish challenging but achievable goals, and
- define corresponding improvement actions to meet those goals
- define actions to address challenges you will face in making those changes

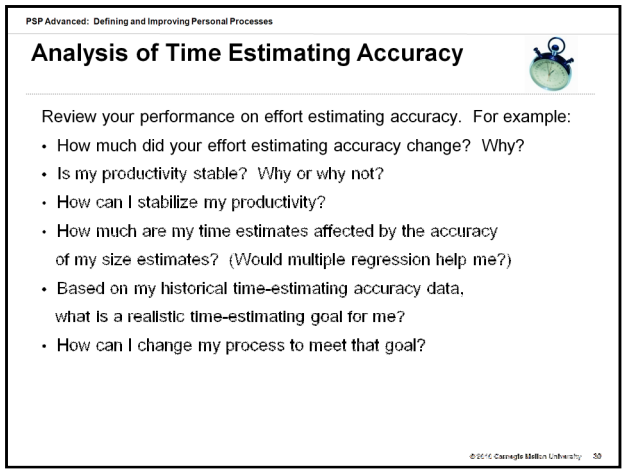
Some Cautions

Don't over analyze only one piece of information. Please remember to look for trends.

Don't do a superficial analysis (e.g. don't describe a chart, *analyze* it).



The answer to many of these questions would make excellent PIPs



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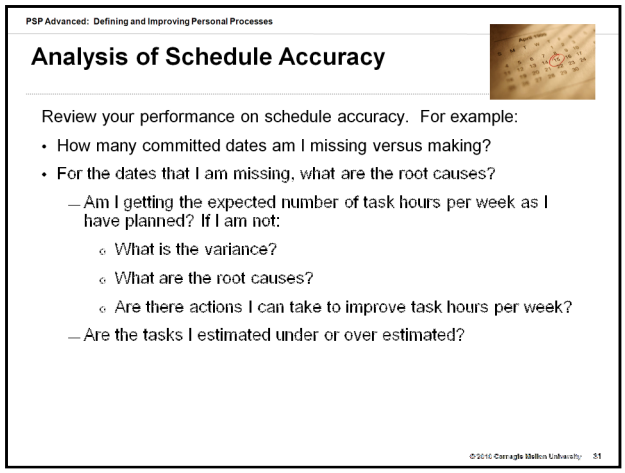
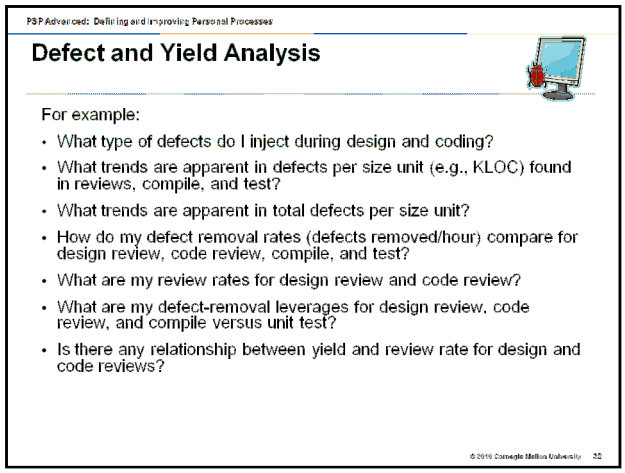


The answer to many of these questions would make excellent PIPs

NOTE: These questions are not very useful for analyzing PSP class data, but are needed for analysis in the real world.



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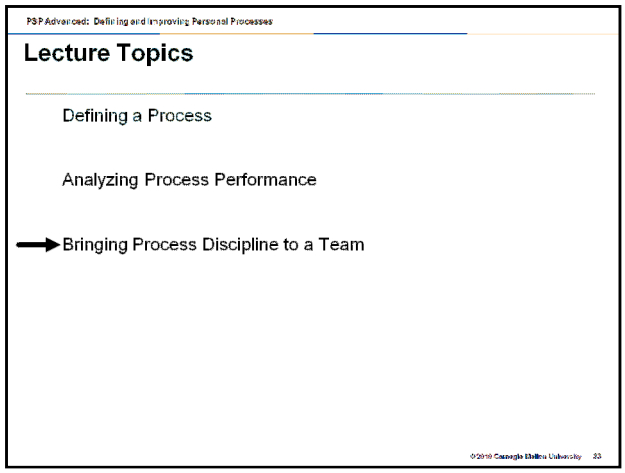


Process Manager Team Role

- Ensures that the team has defined processes available for all key activities
- Assists team members in defining and using processes
- Ensures that team process data are promptly reported and analyzed
- Assists the team in identifying and resolving process problems
- Manages the team's process improvement proposals (PIPs)

Process Support Activities

Ensures that defined processes are available for major development, management, and team activities

Leads the team in developing the processes that the team needs

Ensures that team members are familiar with each defined process and, where necessary, are trained in its use

Ensures that the team always follows a defined and documented process

Ensures that the team has defined processes available for all key activities

Process Tracking and Analysis Activities

For Tracking, ensures that:

- all team members report their process data in a timely way
- where members are late providing their process data, promptly gets their data or calls on the Team Leader for help

When analyzes the team process data

- Identifies where the team or any team member has problems following the defined process

Assists team member's improvement efforts

PIPs

The Process Manager manages:

- elicitation
- gathering
- recording
- tracking
- handling

of the team's PIPs.

Reporting Status

The Process Manager:

- reports weekly to the team on the status of all team process development and analysis work
- alerts the team and Team Leader when process problems need their attention
- maintains the data to produce the process section of the project report during the phase and project postmortems

Questions to ask as Process Manager

Does the team have defined processes for their principal activities? If not, what processes do you recommend be defined, and by whom?

Do these processes reasonably represent the way that the work is currently being done? If not, are PIPs being submitted to correct the processes?

Are the team members following the processes that they have?

Is management providing the support needed to get the defined processes followed? If not, what remedial actions do you recommend?

Do you have a defined process for handling the team's PIPs? If not, what steps are planned to define such a process?

Messages to Remember

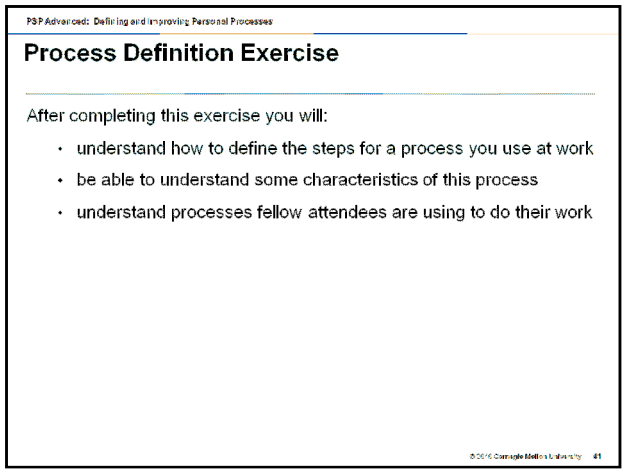
A personal process is a set of steps that individuals use to guide their work.

Defining and using a personal process helps individuals to plan, do, track, and improve their work.

Scripts, measures, forms, and standards are elements of a good process definition.

Start small and define a simple process; then evolve and improve it based on use

Process discipline can be established and maintained on a team through the process manager role.


PSP Advanced: Defining and Improving Personal Processes
Process Definition Exercise
After completing this exercise you will:
• understand how to define the steps for a process you use at work
• be able to understand some characteristics of this process
• understand processes fellow attendees are using to do their work
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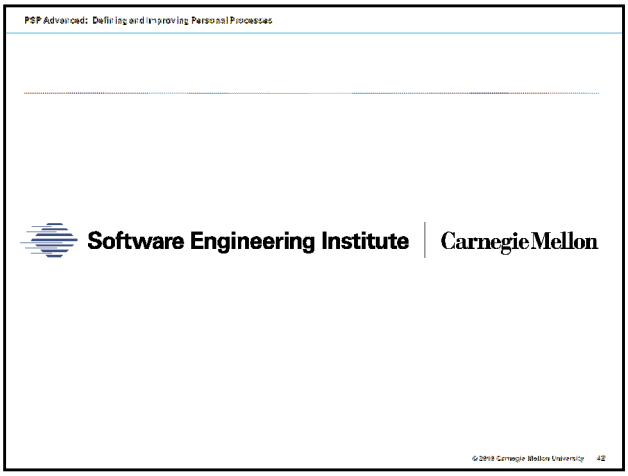
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