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Balancing Agility and Discipline

A Guide for the Perplexed

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Balancing Agility and Discipline

Tools and Environment

Web-based data collection and standard OO tools

The team is using a Web-based tool to support PSP/TSP data collection and earned value reporting. The development environment is typical of object-oriented (OO) programming. Office layout is standard modular offices with each developer having a dedicated machine. A conference room with computer network and projection capabilities is available for meetings and inspections. There is a dedicated integration and test machine in an unoccupied cubicle.

Project Planning

Plans anchor TSP, but are routinely adjusted

At the beginning of the project, a four-day planning session (referred to as a TSP Launch workshop) was held with all the team members and the project management personnel. During the workshop the team defined the project goals, established team roles based on TSP role scripts (Figure 3-1 is an example of a role script from TSPi, Humphrey's instructional version of TSPi), defined the project processes, developed quality and support plans, and agreed on an overall product plan and schedule. Over 180 tasks were identified, estimated, and planned. Upper management, marketing, and customer representatives communicated their requirements to the team on the first day of the launch and agreed to the plan the team created on the final day of the launch.

Agile early, team is applying more rigor in development

The team recognized the need for considerable agility during the early prototyping phase of the project, and relaxed the requirements for specification change control, inspections, defect tracking, and statistical process control during that phase. This phase, however, is more critical to the delivery of the system, and so more of the TSP discipline is being applied.

Status

Nearing end of first phase

The project is in the third month, and a relaunch workshop is planned within the next two weeks. Nothing has been delivered, but a prototype

Objective	The Quality/Process Manager supports the team in defining the process needs, in making the quality plan, and in tracking process and product quality.
Role Characteristics	The characteristics most helpful to quality/process managers are the following. 1. You are concerned about software quality. 2. You are interested in process and process measurements. 3. You have some experience with or awareness of inspection and review methods. 4. You are willing and able to constructively review and comment on other people's work without antagonizing them.
Goals and Measures	Team member goal: Be a cooperative and effective team member. • Measures: Team PEER ratings for team spirit, overall contribution, and helpfulness and support Goal 1: All team members accurately report and properly use TSPi data. • Measure 1: The extent to which the team faithfully gathered and used all the required TSPi data Goal 2: The team faithfully follows the TSPi and produces a quality product. • Measure 2.1: How well the team followed the TSPi • Measure 2.2: How well the team's quality performance conformed to the quality plan • Measure 2.3: The degree to which you kept the team leader and instructor informed of quality problems • Measure 2.4: The degree to which you accomplished this goal without antagonizing the team or any team members Goal 3: All team inspections are properly moderated and reported. • Measure 3.1: All inspections were conducted according to the INS script and the team's quality standards. • Measure 3.2: INS forms are completed for all team inspections and all major defects reported on the owners' LOGD forms. Goal 4: All team meetings are accurately reported and the reports put in the project notebook. • Measure 4: The percentage of the team meetings with reports filed in the project notebook
Principal Activities	1. Lead the team in producing and tracking the quality plan. 2. Alert the team, the team leader, and the instructor to quality problems. 3. Lead the team in defining and documenting its processes and in maintaining the process improvement process. 4. Establish and maintain the team's development standards. 5. Review and approve all products before submission to the CCB. 6. Act as the team's inspection moderator. 7. Act as recorder in all the team's meetings. 8. Participate in producing the development cycle report. 9. Act as a development engineer.

Figure 3-1 TSPi Script for the Quality/Process Manager Role[1]

of the enhanced functionality has been demonstrated to management. Integration testing for the first phase is scheduled to begin next week.

The Day's Activities

8:30 Usually the team begins work on their planned tasks upon arrival. However, today, because of some organizational information that needs to be discussed, Jan gathers the group and provides a brief summary of her organizational staff meeting. While they are gathered, Fahad raises an issue regarding an item in the graphical interface as specified in the Software Requirements Specification (SRS). Margaret indicates she has a meeting with the customer at 2:00 and will address the question. With no other concerns raised, the group disperses to their work areas. Panitee reminds Bashar and Jim that there is a detailed design inspection of Fran's inventory order projection module at 1:00.

9:00–10:30 Fran finishes the unit test development on her module design in preparation for the inspection this afternoon. Her design is based on the Software Requirements Specification developed following the tailored REQ script earlier in the project.

Jim begins a personal code review on the inventory status reporting module he finished coding yesterday. He knows from his personal review history that he typically injects 27 coding defects per KSLOC and that in his code reviews he removes about 6 defects per hour. This morning he plans to spend one hour on the review. As he starts, he logs into the time-tracking system and indicates the activity he is working on. Jim reads through the code multiple times, each time looking for a different kind of defect, using a checklist of defect types.

The phone rings and he changes the mode in the time-tracking system. After conferring with his wife on the weekend's activities, he changes

the mode back to code review. When he is confident he's found and corrected all the defects that he can and that the number is sufficiently close to his target, he again changes the mode on the time-tracking system, compiles the module, fixes any compilation errors, and begins using the test procedures he developed to make sure the module behaves properly. He logs all the defects he finds according to whether they were found in review, compilation, or test so he can maintain his personal defect rates as well as support project-wide tracking.

Bashar works with the corporate IT staff to resolve an issue with the automated configuration management system. He uses a TSP manual form for recording his time distribution in minutes, including breaks.

Jan attends a divisional strategic planning meeting.

Panitee reviews the current component data collected against the team quality plan to make sure the modules completed are of sufficient quality to be added to the baseline. She uses the automated data collection tool to check the relationship between time coding and time designing, time reviewing and time designing and coding, defects found in review against those found in compiling, defect discovery rate, and review rate. The tool produces a component quality profile (see Figure 3-2), which Panitee uses to identify any questionable work. No modules were identified as problematic, so no decisions need to be made as to how to proceed. Overall, at this point in the development, all the metrics seem in line with those projected, except for the review rate, which has been consistently higher than the planned 200 lines of code per hour. Given that the defect detection yield has not decreased, this is not seen to be a problem.

11:00–12:30

Greg and Jan begin preparations for the relaunch workshop for the next cycle of the project. They compare the actual progress against the

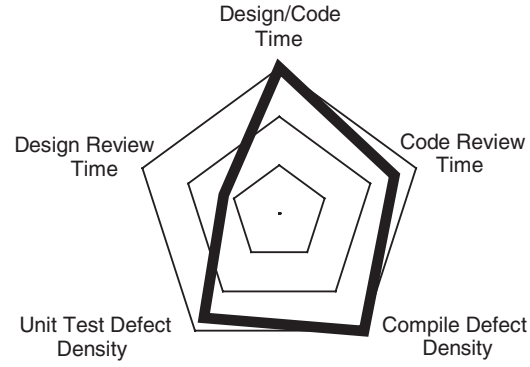

Figure 3-2 Example Quality Profile Showing Anomalous Design Review Time[2]

original launch plan, noting any significant deviations that have occurred since that time and how they might impact the next cycle. It is clear that at least one module that was slated for completion in this cycle won't be ready, but there are two others that actually came in under the estimates and so some work has begun on modules originally slated for the next cycle.

The other team members continue working, making sure they log the time spent on their various project tasks as well as interruptions to their work due to responding to e-mail, phone calls, meetings, breaks, and such. So far the average time spent on project tasks has been around 18 hours per week per person—slightly lower than their initial projections.

1:00–4:30 Panitee conducts the detailed design inspection of Fran's inventory order projection module according to the TSP script (see Figure 3-3 for the TSPi inspection script as an example). Fran, Jim, and Bashar support Panitee in the inspection. They follow a formal inspection process, and data is collected on the number and severity of defects found, time spent, and the size of the module. The inspection rate as well as an

Purpose		To help engineers produce quality products
General		• The purpose of inspections is to focus on sophisticated issues and not on finding simple defects or fixing defects. • Even a few simple defects can distract reviewers so that they are more likely to miss sophisticated problems.
Entry Criteria		A completed and reviewed product with available materials
Step	**Activities**	**Description**
1	Plan the Inspection	The producer (or developer) • Arranges with the quality/process manager or some other qualified team member to be the inspection moderator • Handles the mechanics of setting up and running the inspection The moderator (usually the quality/process manager) • Reviews the product to ensure it is ready for the inspection • If not, has the producer fix the problems before proceeding • Selects the other inspection members
2	Hold the Inspection Briefing	The moderator describes the inspection process. The producer familiarizes the inspection team with the product. The reviewers select viewpoints or areas for product concentration. • Sample viewpoints are operation, recovery, maintenance, security, installation, size, and performance. In design inspections, the reviewers also ensure that • At least one reviewer will verify each segment of the design • At least one reviewer will use trace table and/or state machine analysis on every design segment The moderator sets the date and time for the inspection meeting.
3	Review the Product	• The reviewers separately make detailed product reviews. • They mark the defects found on the product documentation. • They record their preparation time.
4	Open the Inspection Meeting	The moderator opens the inspection meeting and • If any reviewers are not prepared, reschedules the meeting • Outlines the inspection meeting procedure
5	Conduct a Product Walk-through	The moderator steps through the product sections and • Has the reviewers describe every defect found • Enters the major defect data on the INS form • Notes the engineers who found each major defect • The owner (producer) enters the major defects in LOGD

(*continued*)

Figure 3-3 TSPi Inspection Script[3]