

Experiences Coaching Product Development Teams

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The Continuing Gap

- Both the state of the art and the state of the practice in software engineering are moving forward.
- There remains a wide gap between the state of the art and the state of the practice.
- Coaching is a way to more effectively and quickly narrow the gap.

From Evolution to Revolution

- Most software process improvement efforts have been based on an evolutionary approach.
 - Evolution takes time.
 - Watching evolution happen can become a bit boring!
- A revolutionary approach is emerging, based on lessons we've learned from many years of involvement in software process improvement efforts.
 - Revolution requires bold action, passionate commitment, and strong guidance.
 - It is faster, more effective, and exciting!

Key Elements of the Revolution

- Focus on the project teams and the work of the individual engineers.
- Specific and in-depth how-to training and guidance.
- High motivation.
- Simplicity.
- Focused use of data.
- Bottom-up process improvement.
- Coaching.

Focus on the Project Teams and Engineers

- High performance can only be achieved by effective implementation by the individual engineers working together effectively as a team.
- The focus should be on where the work is done – by individuals and their teams.
- This is best achieved by self-directed teams aided by coaches.

In-Depth How-to Training and Guidance

- Team members trained together.
- Intense exercise-based training based on model processes.
- Directly related to the job at hand.
- Just-in-time for immediate application.
- Transitioned to the job with the aid of a coach, with additional on-the-job training and coaching.

High Motivation

- Excellence is achieved by teams that are highly motivated.
- The challenge and effective results of the revolutionary approach are motivators.
- The teamwork aspects of the revolutionary approach lead to people motivating and supporting each other.

Simplicity

- “...as simple as possible, but no simpler.”
- Brief, yet complete, process descriptions.
- Natural processes and measures.

Focused Use of Data

- Statistical control.
- Based on a few key base measures:
 - Size
 - Effort
 - Defects
 - Schedule
- Quantitative control of quality.
 - Inspections as a source of data on quality.

Bottom-Up Process Improvement

- Starts with individuals and project teams.
- Starts with a few projects.
- Processes are defined and refined “on-the-job” by the people using them.
- Project teams begin naturally sharing their processes and process improvements, leading to eventual consensus and organization standards.
- Since these processes are defined by the teams, the teams have ownership and acceptance and the processes fit their needs well.

Coaching

- Expert on-the-job coaching of the project team.
- The characteristics of a coach are
 - Product development experience
 - Management experience
 - Training experience
 - Ability to work with product development teams
 - Ability to work with management
 - Ability to guide teams, and celebrate in their successes

Coaching Principles

- Team coaches follow these principles*
 - Build talent (training, on-the-job guidance)
 - Setting high standards
 - Focus on success
 - Focus on improvement
 - Improve in steps
 - Celebrate every step
- Coaching is needed for
 - Team members
 - Team leader
 - Management

*[Humphrey]

Build Talent

- Work with team members to
 - Understand their potential
 - Help them improve
- Be involved with the team and team members at all times to provide “just-in-time” support whenever needed.
- The next few slides show an example.

Team Member (Quality Manager)



So, I've completed the first of my coding tasks. That's the good news.

The bad news is that the size estimate from the conceptual design was way, way off. We said 75 LOC for this function (what were we thinking?), when in fact, it turned out to be a little over 300 LOC.

The good news about this bad news is that time it took me to do this was not as underestimated. Not even close.

I'll keep you guys up to date as I get more data.

Team Member (Planning Manager)

Did you count the 300
with BeyondCompare?



Team Member (Quality Manager)



That's right. I went through and diffed each file in Perforce, and ran the File Comparison report. Is that the right idea?

Team Member (Planning Manager)

Cool. Personally, I'm not as worried about the size estimate being wrong as much as I am about our productivity. Does your data say anything about this?



Team Member (Quality Manager)



OK, I have another question.
Why is my planned productivity 15
LOC/Hr? I thought the rate we used to
estimate time for this chunk of code was
12.0.

Um... I think I see. When we re-planned,
we increased the planned size for this
module. But since design, design review,
and design inspection were already
complete, I did not change the planned
effort for those tasks. Should I change
those?

Or just not worry about this?

Coach

As you have noticed, the planned productivity data may be a little off, because the size estimate was changed after you completed some of the work in the earlier phases.

Don't worry about updating the plan data, because we baselined the original estimates, and the data reflects reality.

I am excited to see this data (we coaches are easily excited)! How did the code review go? Did you find any defects? Did you update your checklists?



Setting High Standards

- In a world where the only constant is change, the coach must always work from a set of principles. Some examples are
 - Teams must follow their defined process
 - Focus as much (if not more) on quality as schedule
 - Early defect removal is most cost effective
- Understand what superior work looks like

Applying Principles – An Example

- The team was fighting using the standard process which called for personal reviews and team inspections before unit test.
- I discussed the basic principle with the team: defect removal before test is important, and defects must be measured and managed.
- Then, I gave the team the freedom to define their own process that conformed to these principles.

Focus on Success

- The coach must always focus on success for the current project and the current team
 - Make sure the team has defined measurable goals based on business and product goals
 - Ensure goals are tracked
 - Keep the team focused on meeting the goals

Focus on Success – An Example

- One team wanted to add too many process steps
 - Personal reviews
 - Informal peer reviews
 - Formal inspections
 - Fully automated unit tests
- I discussed the diminishing returns on quality and negative impact on schedule.
- After a long discussion with the team, a consensus was reached to
 - eliminate the informal peer review
 - automate unit tests only for critical modules.

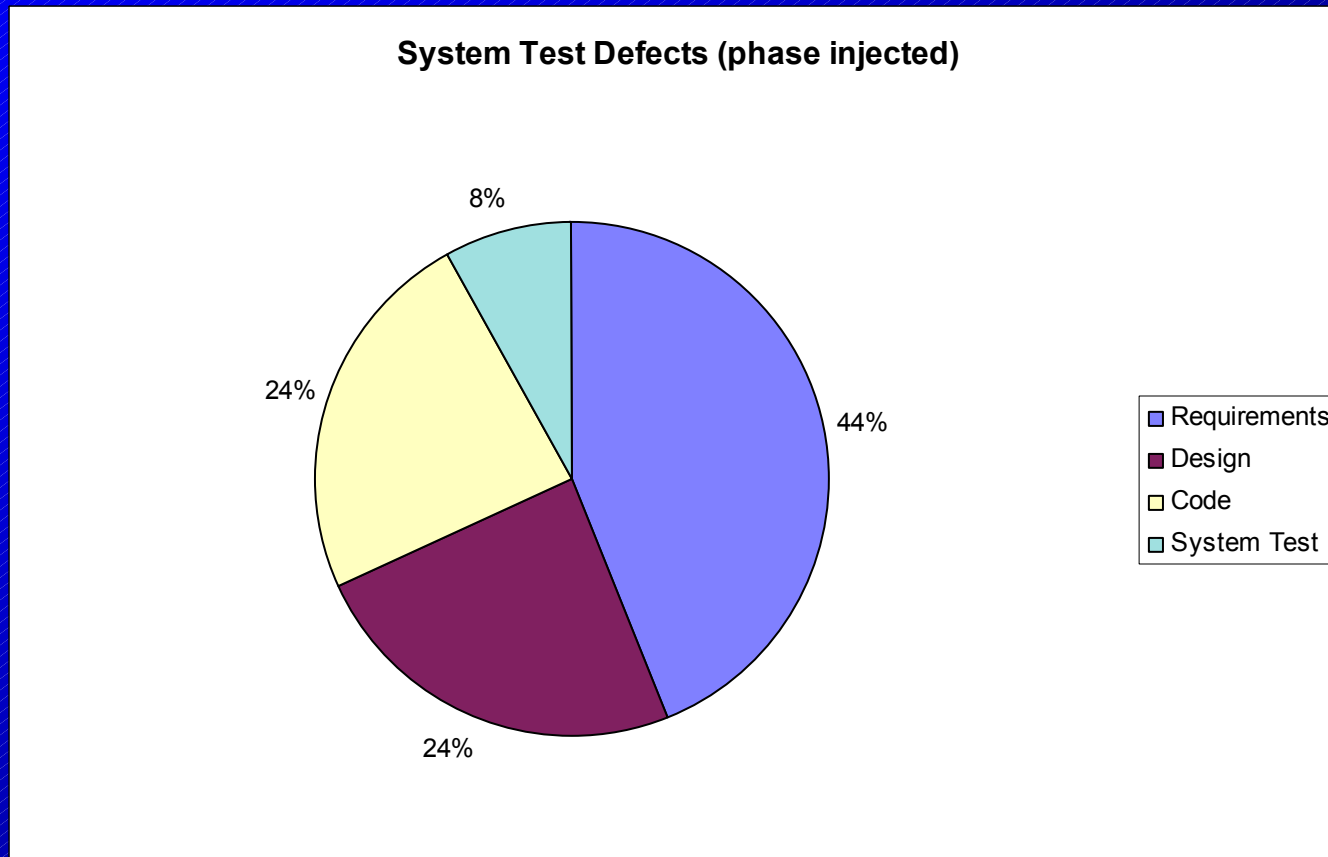
Focus on Improvement

- When the team does well, it is tempting to celebrate and rest on their laurels
- A coach must always gently nudge the team towards improvement
 - Celebrate the success to date
 - Guide towards even greater success

Focus on Improvement – An Example

- The team did an excellent job
 - Team removed 87% of all defects before entering system test
 - Highest quality product in the larger release
- However, postmortem analysis showed area for improvement

Focus on Improvement - Requirements



Improve in Steps

- Don't insist on or expect perfection
- Teams adopt the process at different rates
- Team members improve at different rates

Improve in Steps – The Quality Journey*

- Test and fix
- Inspect
- Partial measurement
- Quality ownership
- Personal measurement
- Design
- Defect prevention
- User-based measurement

*[Humphrey]

Celebrate Every Step

- Quality work can be invisible
- The coach must make sure every success, small and large, is celebrated.
 - Encouragement at the individual level
 - Making successes visible to management

Conclusion

- Our experiences coaching dozens of real-world project teams show that
 - Project focused process improvement works
 - It shows measurable results quickly
 - Although there are lots of elements involved, coaching project teams through their process improvement journey is the key element

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- References

- [Humphrey] *Coaching Development Teams*, Addison Wesley, Reading, MA, In Press