
TSPSM / PSPSM at Intuit

SEI SEPG 2005

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Agenda

- Who is Intuit?
- What is TSP/PSP...and Not?
- TSP/PSP - Why does Intuit Care?
 - Intuit Goals
 - TSP/PSP Goals
- FY 2004 TSP/PSP Pilots
 - Pilot Environment
 - Pilot Data and Results
 - Successes
 - Lessons Learned
- Shareable Best Practices
- FY 2005 TSP/PSP plans
- Elements of Success

Who is Intuit?

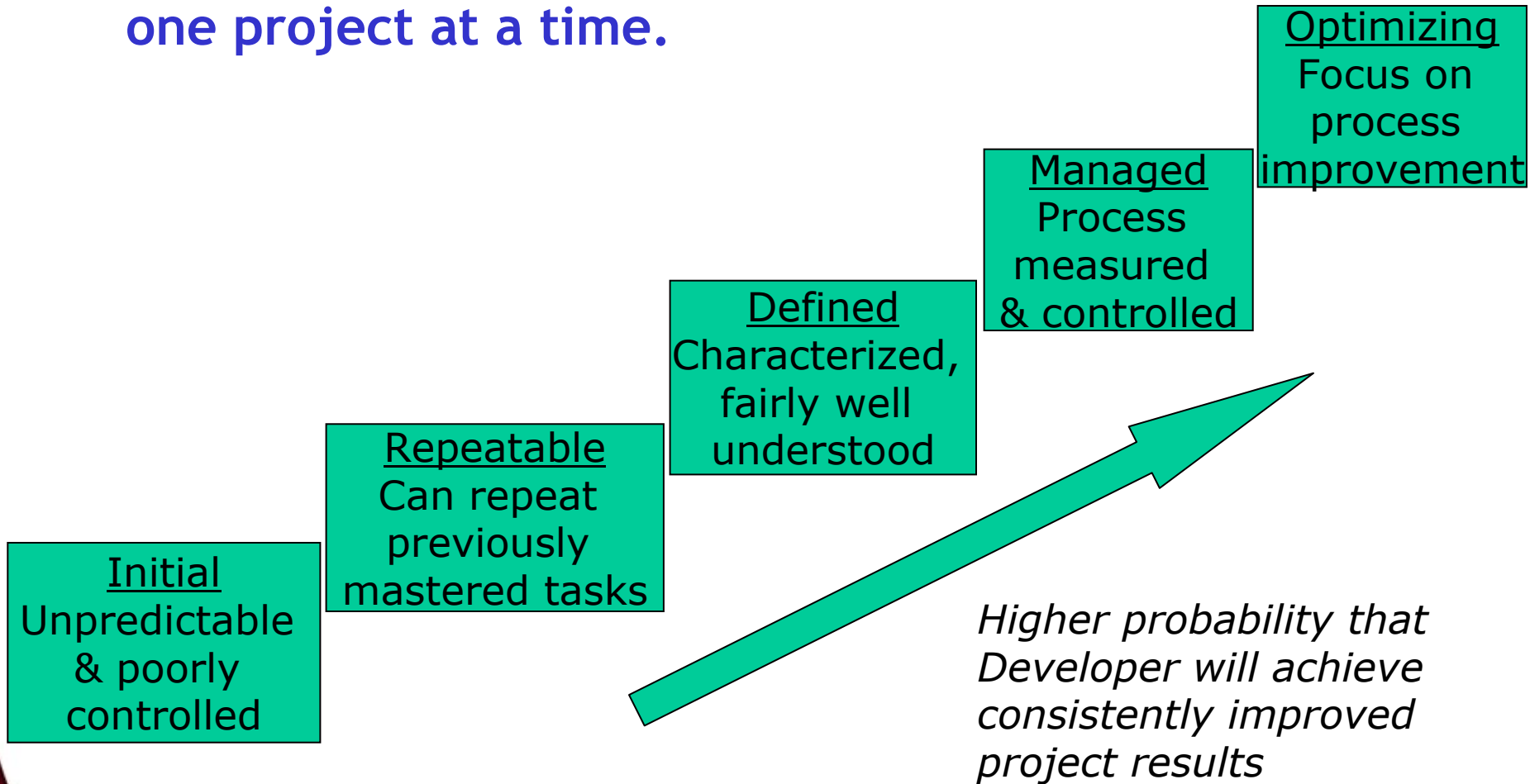
Intuit's mission:

Transform how people manage their financial lives and small businesses manage their businesses

- **Leading provider of business and financial management solutions for small and mid-sized businesses, consumers and accounting professionals**
- **Makers of TurboTax, Quicken, and QuickBooks**
- **2004 Revenue of \$1.87 billion**
- **Nearly 7000 employees**
- **Fortune™ magazine named Intuit one of the 100 Best Companies to Work for!**

How is Software Process Quality Measured?

TSP/PSP increases maturity
one project at a time.



What does TSP/PSP Provide?

Key Process Areas

Requirements Management	Partial - scripts
Project Planning	Yes - detailed to 5-10 task hours
Project Management and Control	Yes - ongoing in prescribed weekly meetings
Measurement and Analysis	Yes - TSP tool enables metrics and analysis
Process and Product QA	Yes - ensures time allocated for engineering best practices
Team Reviews/Inspections	Allocates time explicitly for their use
Configuration Management	Not specifically

What is TSP/PSP... and Not???

- **It is NOT:**

- a Silver Bullet solution
- a radically different approach to development
- a new programming language
- a way to invent more task time

- **It is:**

- a framework that allows detailed planning and tracking of project status
- a vehicle to collect “in process” metrics to provide insight and opportunities for improvement
- a team building approach
- a way to protect development steps needed to “build in” quality

What does TSP Provide?

Mindset Change enabled by...

▪ **Project Management**

- Detailed planning and tracking
- In process metrics
- Prescribed weekly meetings to review metrics
- Task hour monitoring
- Earned value

▪ **Team Building**

- Shared leadership/Roles
- Team coach (project mgmt co-pilot)
- TSP launch (communicate with stakeholders)

The development process is not fundamentally different...
the mindset (managing by data (and judgment)) is different.

What does PSP Provide?

■ **Measurements**

- Size
- Time
- Defects

■ **Best Practices**

- Task breakdown -> Detailed planning
- Time allotted to Design (and illustration understanding of its importance)
- Size estimation methods
- Time allotted to Review/Inspection
- Time tracking
- Defect tracking
- Metric analysis
- Coding standards

Intuit CTO FY 2004 Goals

- **Create a vibrant, creative, challenging environment for technical and product management professionals**
- Deliver an exceptional total customer experience to increase the number of promoters and net promoter scores from Intuit customers
- Select and prioritize the right offering and infrastructure initiatives
- **Deliver** and support **offerings** and infrastructure in a **high-quality, predictable, efficient and disciplined manner** enabling both short- and long-term BU/FG success

Intuit TSP/PSP Goals

- Improve Quality -> Higher Productivity
- Predictability
- Visibility
- Efficiency
- Continual Improvement
- Self-directed Teams
- Mindset Change

Intuit TSP/PSP Timeline

September 2003	Watts Humphrey presents at Intuit's annual Tech Forum
November 2003	1 st TSP/PSP Executive/Manager Session -> pilot teams selected amongst volunteers
December 2003	1 st set of PSP for Engineers classes (Mountain View)
January 2004	Intro to PSP class offered to product management, QA, UI designers and testers
February 2004	2 nd set of PSP for Engineers and Intro to PSP classes (San Diego)
March 2004	All 3 pilot teams launch!
November 2004	All projects complete

Complete TSP/PSP training and implementation in one year!

FY 2004 TSP/PSP Pilots and Goals

■ Pilots:

- QuickBooks “flavor” edition (product enhancement)
- BOB Handshake (infrastructure)
- QuickBooks Mac

■ Goals:

- < .1 defect/KLOC in shipped product
- On-time delivery of project
- LOC estimation within +/- 5% of actual
- Improved communication with project stakeholders.

TSP/PSP Support Infrastructure

■ Training

- All team members and management trained

■ Coaches

- SEI provided
- Instructor and coach were consistent for each project
- Support/direction during launch
- Weekly meeting support
- Coaching “as needed”

■ Tool

- Used SEI tool
- Crucial element of data collection
- Difficult to learn/easy to use

■ Corporate/SEPG Support

- Funded training and pilots
- Observed/monitored pilot progress
- Internal “TSP Users Group”

BOB Handshake Pilot Environment

■ The Management

- Project Manager - exceptionally committed
- Director - committed; had to “keep the wolves at bay”
- VP - committed, but also under strong pressure to meet program commitment; swayed by strong team commitment; gave team permission to throw process overboard if it jeopardized project commitments

■ The Team

- Very process focused and experienced
- Exceptionally committed
- Large team and then added subcontractors
- Team members had camaraderie and this enhanced their team feeling

■ The Project

- “Mission Impossible”
- Part of a large, complex program spanning BUs
- Central component
- Significant time pressure (project started late due to training and launch)

TSP/PSP Pilot Goals – How did we do?

BOB Handshake

- **Predictability/Visibility:**

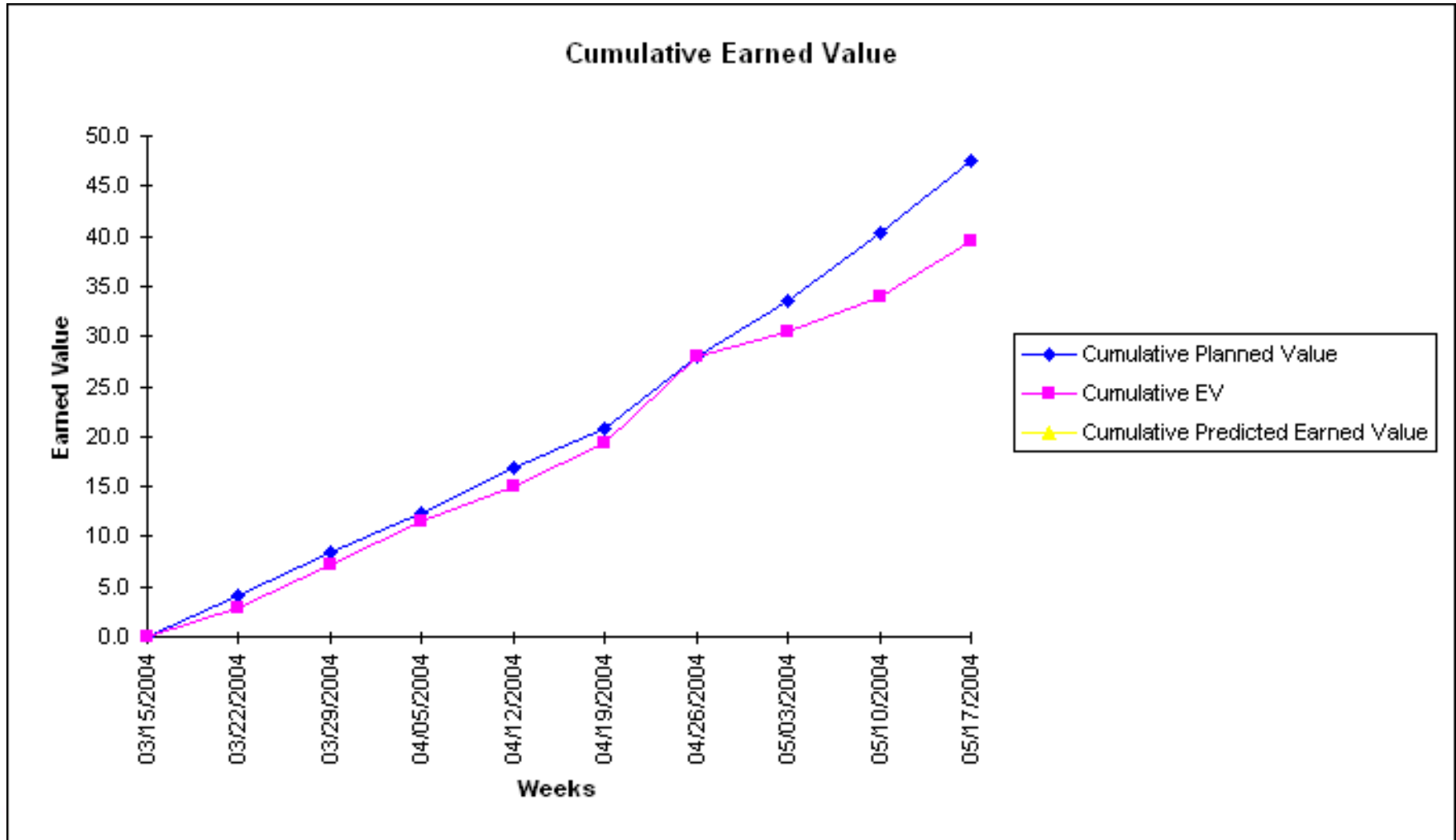
- Phase One: 1 week late
 - De-scoped some function: Team realized early that de-scoping of functionality was necessary to meet schedule
 - Phase Two: on-time

- **Efficiency:**

- Tightly managed load balancing allowed for maximum efficiency
- Caused integration issues across functions ...causing late delivery?

Uh-oh!

The data show we are heading off course...



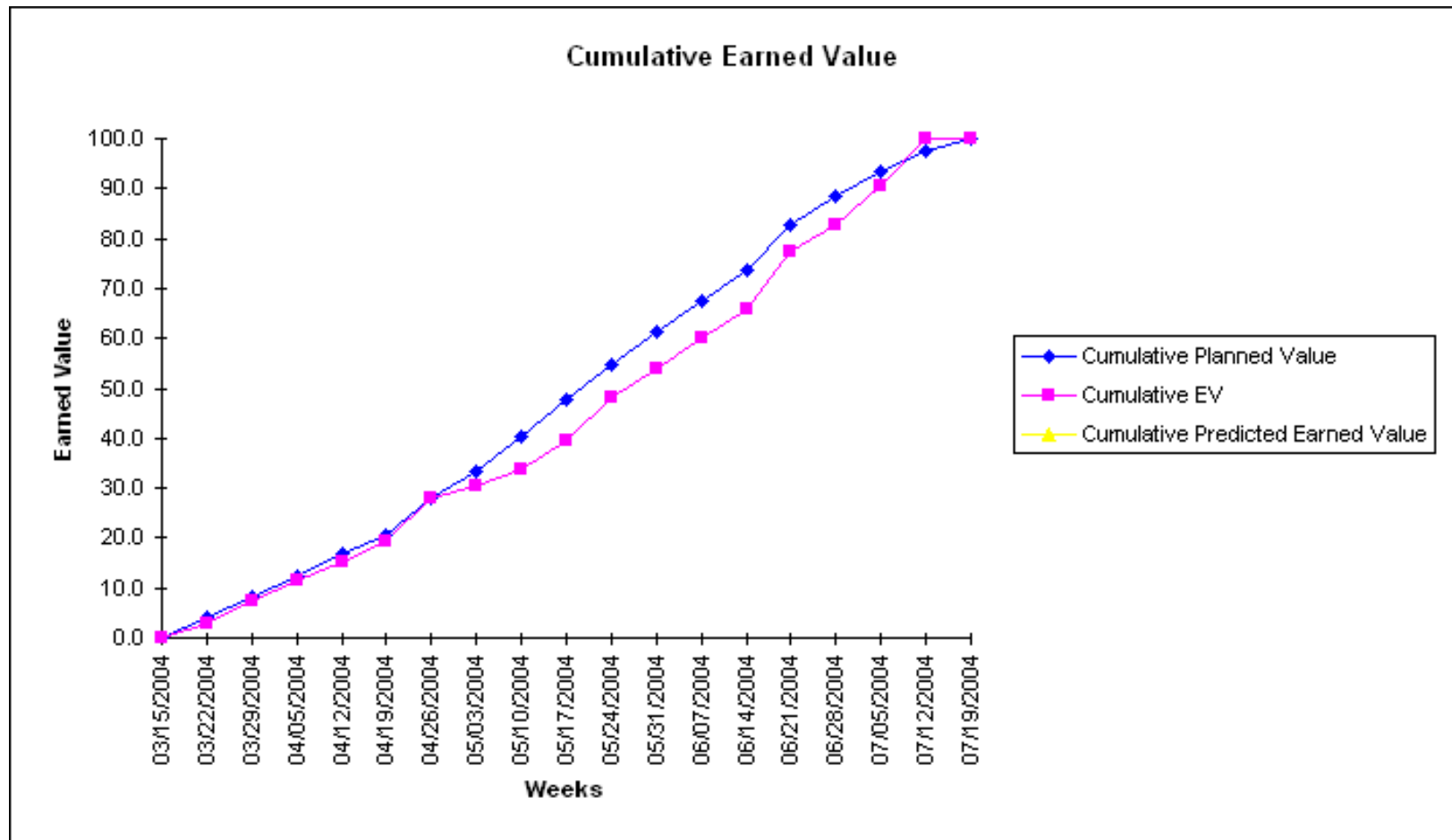
BOB Handshake: TSP Coach Advice

- LISTEN TO YOUR DATA
- *Question: If things continue about the way they are, when will the team finish the July 5th content?*
Answer1: If things continued at exactly the same rate of historical earned value per week, the team would not finish that content until **Mid-November**.
- Answer 2: If indeed the requirements phase is complete and stable, and the rest of the tasks are estimated “perfectly”, and with no extra effort applied, the team would finish about the **end of July**.
- Answer 3: So it is most likely somewhere in the middle of these dates.

What should the team do?

BOB Handshake Pilot

Getting back on track...through a relaunch



TSP/PSP Pilot Goals – How did we do?

BOB Handshake

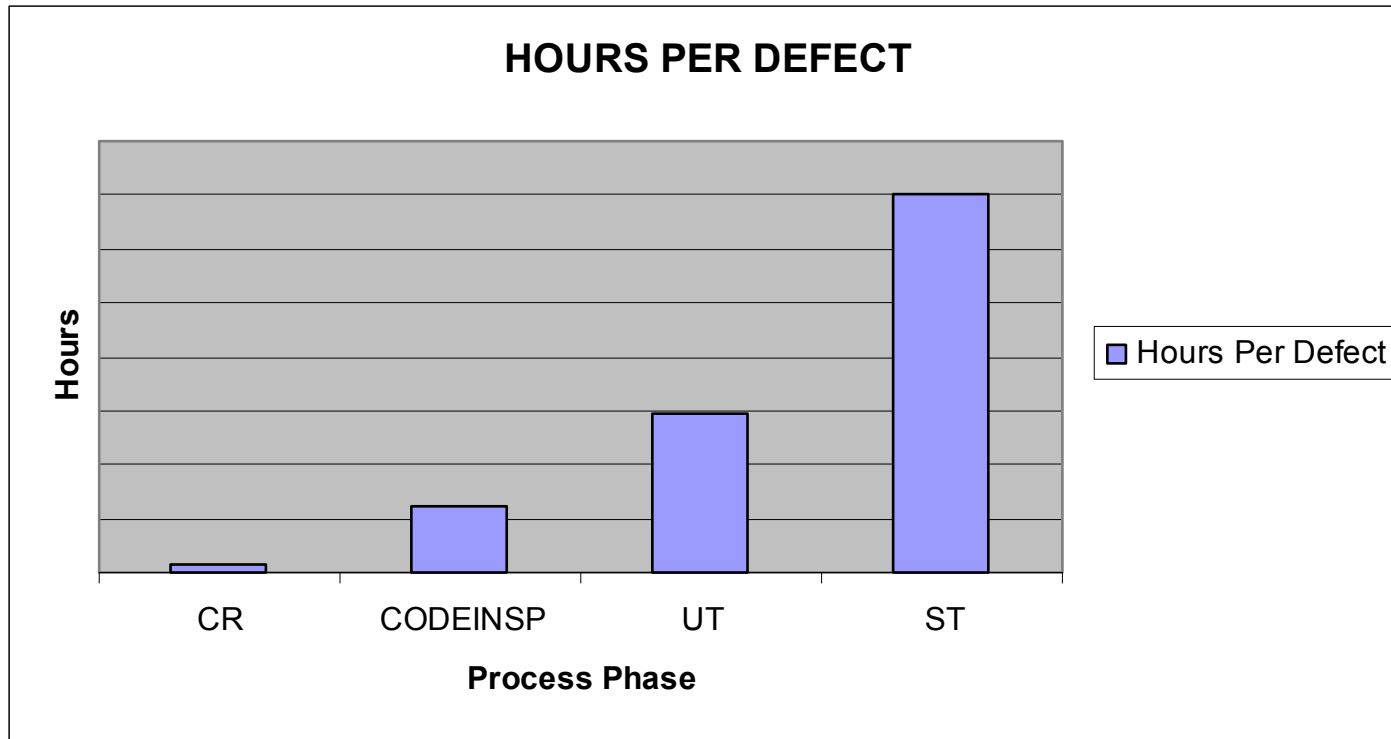
▪ **Quality:**

- Met team goal of cutting defects in half (in system test) of known best (Suez)
- Early indicators (120,000 activations), no field defects

▪ **Continual Process Improvement**

- Ongoing and Postmortem Evaluation of Data/Processes allows for improvements
- Has data for future planning and process improvements

SD&S Bob Handshake TSP Data Cost of Defects Found and Fixed



This data was collected during the BOB Handshake TSP project.

BOB Handshake Pilot Lessons Learned

- The team loved it!
- Easy to see project progress on a weekly basis
- Don't ignore or rationalize away what the data is telling you - optimism is not always as appropriate as realism
- The tools and processes involved in TSP/PSP provide insight into defect injection and removal rates
- Data will enable the team to continually improve the overall quality of the products
- TSP team roles are generic in nature and need adaptation to fit into an SD&S development team

BOB Handshake Pilot Lessons Learned

How to be a TSP Pilot in a large Program

- **Get Program Management Buy-in early**
 - The Handshake Program Office did not have “shared vision” on the timing/importance of this pilot
- **Timing is (almost) everything**
- **Appearance is (almost) everything**
 - Perception is reality
- **Communicate in development terms, not TSP-speak**
 - TSP/PSP is not “Martian” software development

QBG Pilot Environment

■ The Management

- Project Manager - committed, but skeptical (will this work in my environment?)
- Director - very committed and convinced of value
- VP - gave the okay, but not very involved early on

■ The Team

- Not a lot of process experience
- Skeptical, but willing to wholeheartedly try it out
- Two remote team members
- Team members had camaraderie and this enhanced their team feeling

■ The Project

- Four new features
- Fairly self-contained during development
- Adding features to a very large complex code base
- Significant time pressure (project started late due to reprioritization)
- Requirements not well-defined or understood at launch

TSP/PSP Pilot Goals – How did we do?

QuickBooks “Flavor” Edition

- **Quality:**
 - Highest quality product in QuickBooks release
- **Efficiency:**
 - Able to continue development for several additional months (effectively doubling development time)
 - Initial Code Complete date was set for June
 - Quality Assurance accepted incremental deliveries until very late in development cycle due to high quality
 - Continual Process Improvement

TSP/PSP Pilot Goals – How did we do?

QuickBooks “Flavor” Edition

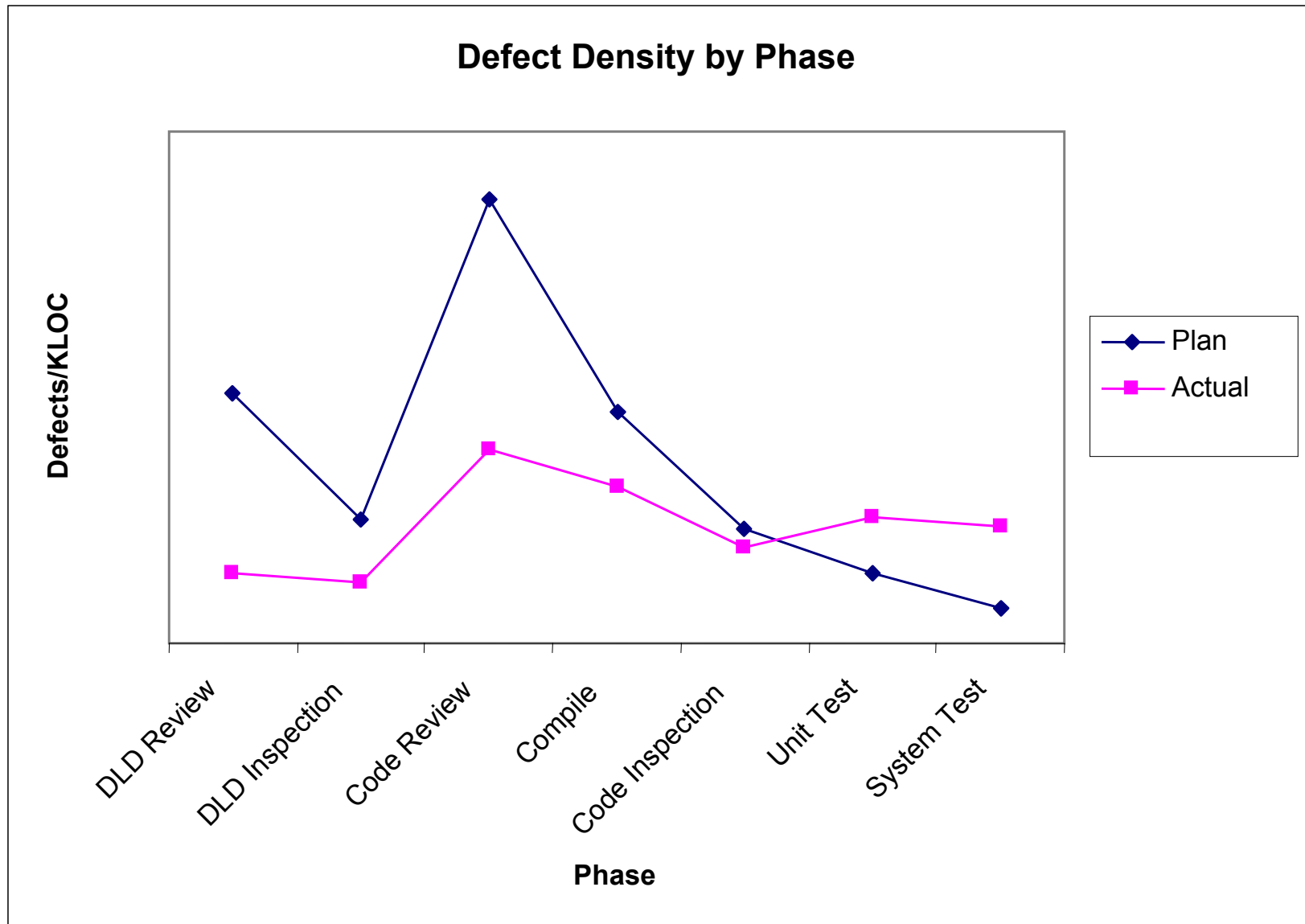
- **Predictability/Visibility:**

- Making a number of small “drops” to system test allowed test team to judge high quality and continue to accept features until very late in cycle

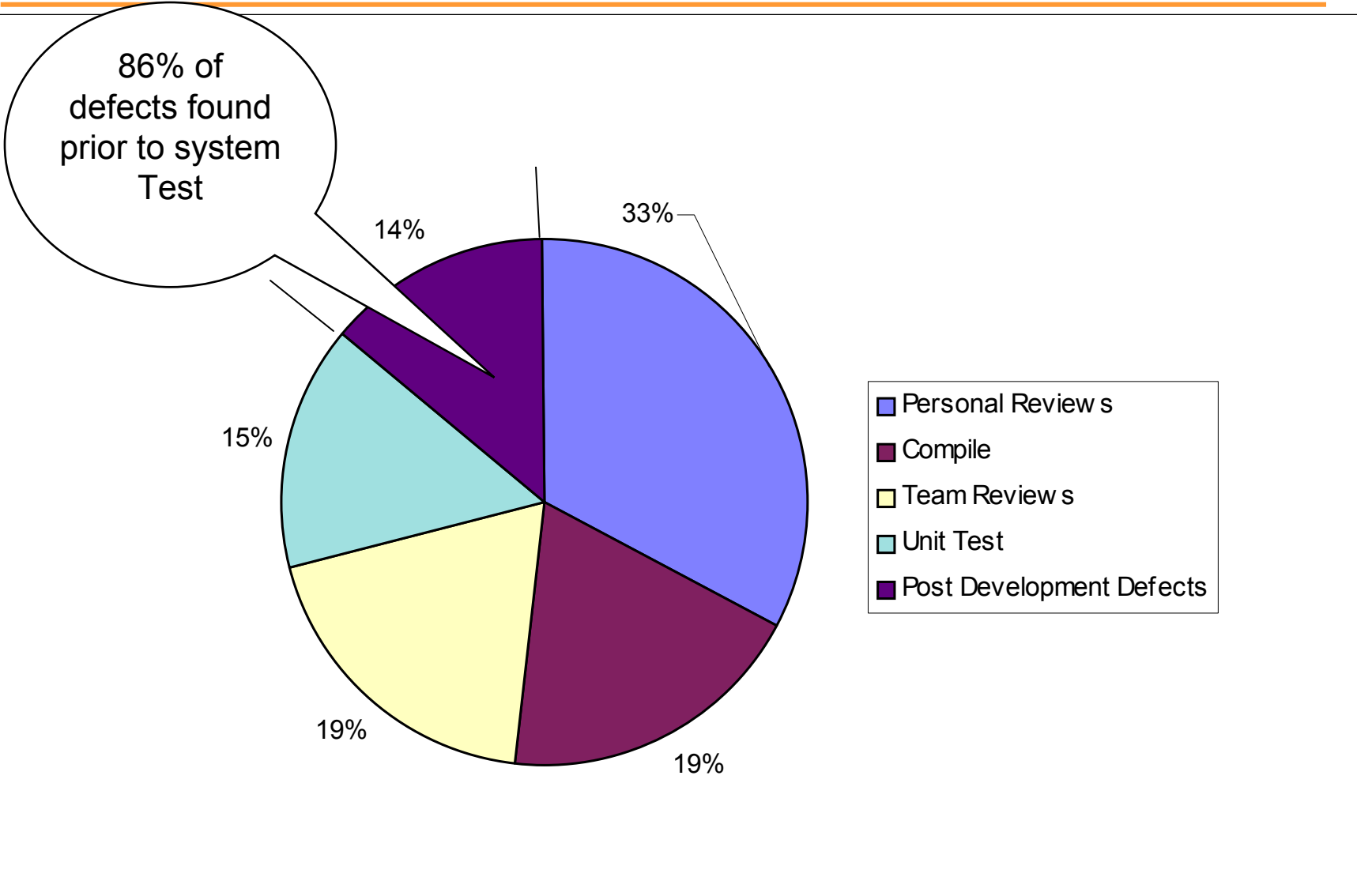
- **Continual Improvement**

- Performed significant data analysis
- Team now has own data showing areas of improvement and for planning purposes
 - Convinced themselves of the value of:
 - Differentiating HLD and DLD
 - Greater explicit detail in design
 - Personal and team reviews/inspections

Defect Density – Plan vs. Actual

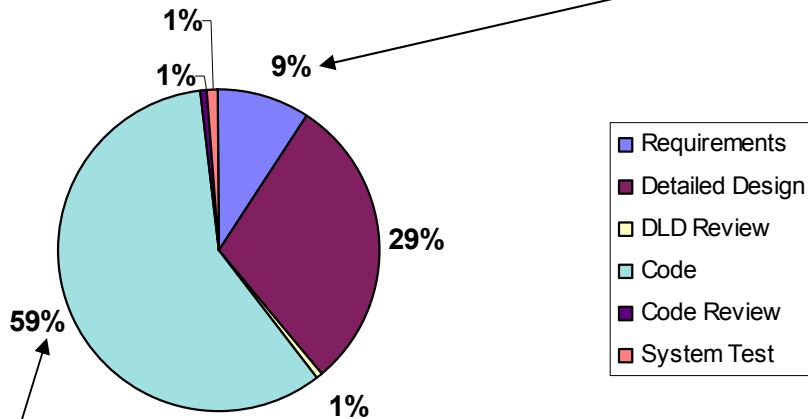


Percent Defects Removed by Activity



Time spent fixing defects based upon injection phase

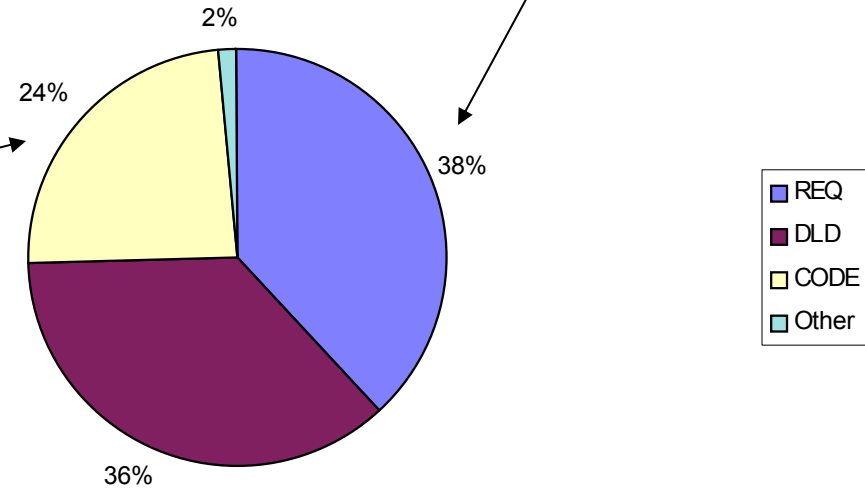
Percent Defects Injected by Activity



Requirements were only 9% of defects injected,

but took 38% of time to fix

Percent Defect Fix Time by Phase Injected

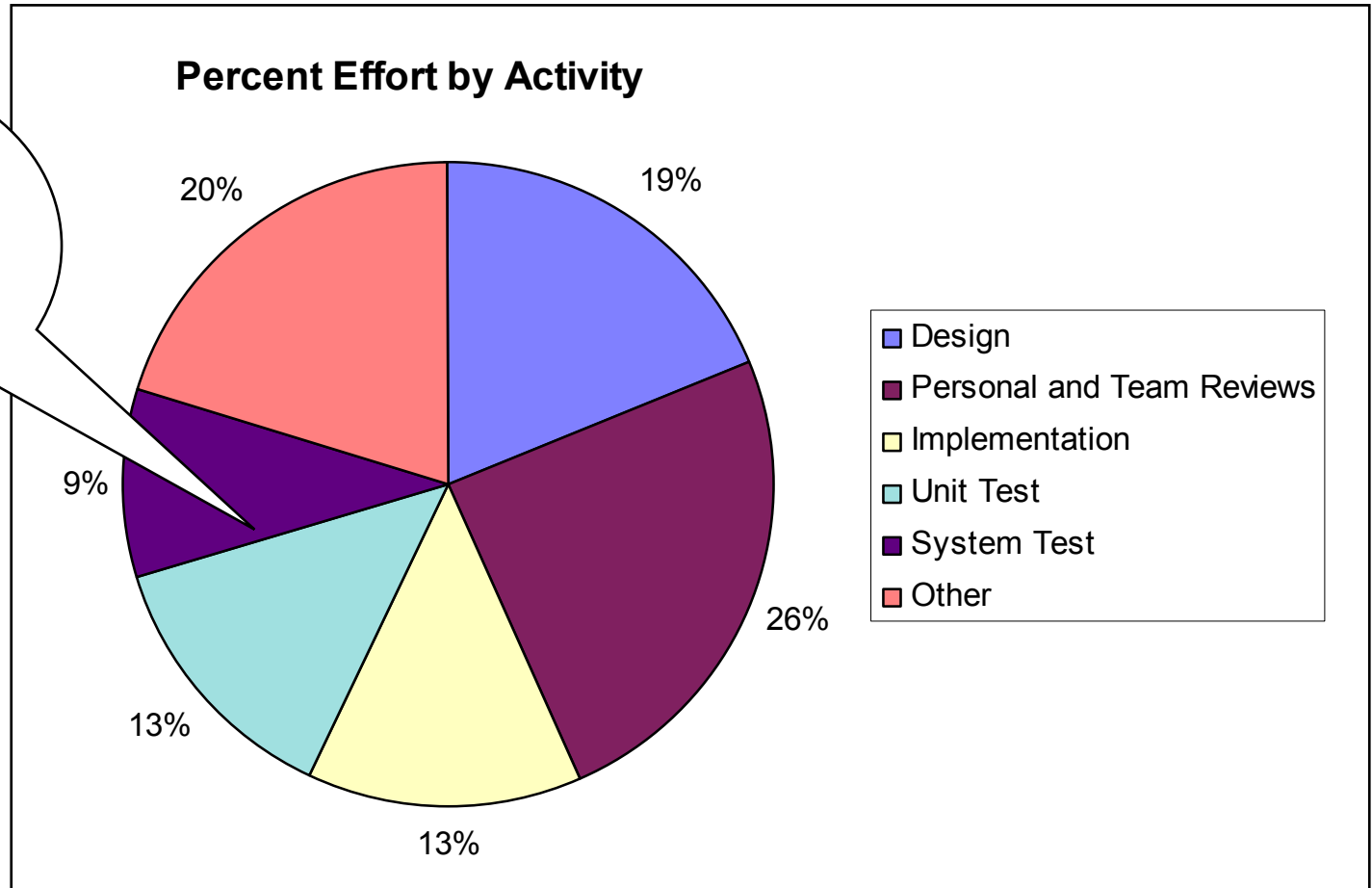


59% of Defects Injected During Coding

But took only 24% of time To fix

Effort Distribution

Compare to typical non-TSP teams who spend 50% in system test!



QuickBooks “flavor” edition

Lessons Learned

- **Task Hours really *are* difficult to get**
- **Easier to handle schedule changes due to requirements changes**
 - Actual LOC was double the initial estimate, but requirements were unknown/unclear at launch
 - Without requirements, assumptions made during conceptual design can be very wrong...need to anticipate this
- **Able to plan, predict and respond to change more effectively**
- **Will include Product Management in future launches**
 - Preparing detailed estimates causes discussion of requirements specifics early
 - Product Managers can make more informed choices regarding features due to earlier size estimates
- **Using industry data was useful for planning purposes**
- **Focus on finding and removing defects early in the lifecycle is significantly less expensive**

QB Mac Environment

■ The Management

- Project Manager - ambivalent and swayed by team
- Product Dev Leader - very committed and enthusiastic
- Business Unit Leader - committed and supportive

■ The Team

- Not enthusiastic about TSP/PSP
- Very skeptical about this working in their environment
- Team lead was new to the company
- Little process experience or interest
- This was a huge leap for them
- Almost all team members were remote
- Some of the remote team members and subcontractors treated as dependencies because they were untrained
- Team grew significantly after launch through subcontractors

■ The Project

- Requirements were not well understood early enough
- Large platform conversion
- Changes to very large, complex code base

TSP/PSP Pilot Goals – How did we do?

QB Mac

- **Pilot aborted**
 - Both project and middle management of pilot team changed midstream
 - Due to large increase of scope, team added subcontractors
 - => 3 of 8 engineers were trained

(TSP requires whole team to be trained)
- **QA continued to use process until project changed direction**
 - Found planning and tracking useful

PSP/TSP Shareable Best Practices

- **Project Launch**
 - Enhanced communication with stakeholders
 - Team building
- **Detailed project planning**
 - Task level (5 - 15 hours per task)
 - Inspections (participants, conference room, dates)
 - Specific dependencies noted
 - Rolling integration drops
 - Load Balancing
- **Defect tracking**
 - “In process” and system test and production
- **Time tracking**
 - Where is development time spent
 - i.e., design vs. test (defect removal)
- **Size tracking**
 - Easily measurable
 - Correlated to effort
 - LOC is a best fit for this measurement

Elements for TSP Pilot Success

- **Focused and willing team**
- **Some experience with process or willingness to experiment**
 - No built in antibodies to process and change
- **Capable and committed project manager**
- **Committed and protective senior management**
 - Willing to support change in the context of current practices
- **Experienced and enthusiastic Coach**
- **Tools in place**
- **Training at all levels**

FY 2005 Plans for TSP/PSP

- Further rollout in QuickBooks organization
- Sustain pilot in Shared Development and Services organization
- New pilots in Tax group
- New pilots in Personal Finance group

Spread shareable best practices throughout Intuit!

Contact Information

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