Integrating Scrum Retrospectives and CMMI High Maturity Practices for Rapid High Value Performance Payback

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Many organizations use Scrum & CMMI
  – But few have pursued higher maturity practices

Presentation goal:
  – Explain why
  – Explain purpose of high maturity practices in simple terms
  – Share 2 case studies using high maturity practices in different ways with a goal to improve performance
Why Scrum and CMMI high maturity practices should fit together

• Retrospective is a key Scrum practice
  – Team reflects on their practices on short cycles
  – Team puts actionable improvement in place
  – Continuous improvement essential to Scrum

But continuous improvement is also essential to high maturity practices

So why the gap?
…One possible reason...

Scrum (perception)  
- Agile 
- Light 
- Nothing extra

High Maturity (perception by some)  
- Rigid 
- Heavy 
- Extra work (e.g. measure, analyze, predict, change)

Do you think *high performing* Scrum teams don’t measure, analyze, predict, change?
An example...

• Previously CMMI Level 4

• Moved to Scrum

• Decided to stop collecting their CMMI Level 4 data

• Why?

• Not consistent with Scrum, not helping...

How do you know if your Scrum team’s improvements are really helping your performance?
Scrum, Measurement & Performance Payback

• I have observed Scrum Retrospectives in multiple organizations

• Some are achieving high value performance payback, and some are not

• If you aren’t measuring you don’t know which group you are in

Also, if not getting payback, there are reasons... so....
• mistakes
• tips

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Statistical Process Control (SPC) Background

• Many practitioners when first introduced to statistical process control (SPC) get turned off by...
  – Math
  – Difficulties setting up measures
  – Terminology
    • Stable process, special/common cause, control charts....

SPC more about observing, predicting, helping your team know when to take action

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Goals of SPC and Scrum Teams

• Goal of SPC
  – To identify and remove unacceptable variation
  – To achieve an appropriate degree of predictability

Key Scrum Team Goals
  Remove “blockers”
  Achieve consistent “rhythm”

These goals should help each other
SPC terms that tend to get in our way

• Simplified explanations
  – We want to observe our practices against agreed and transparent thresholds so the team knows when to take action
  – We establish the thresholds based on our own past performance
  – We investigate situations (outliers) that most likely will lead to high value performance improvements

<table>
<thead>
<tr>
<th>Term</th>
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<tbody>
<tr>
<td>Control charts</td>
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<tr>
<td>Voice of process</td>
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<td>Special cause</td>
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<tr>
<td>Common cause</td>
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<td>Root cause analysis</td>
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Some help selecting measures

- We want to select “leading edge” measures so the situations investigated are:
  - Ones that are hurting your performance the most
  - Ones you can do something about in the near future

Why control charts?
- Can’t investigate everything
- Statistical thinking helps us pick best candidates
Case Study A Background

• CMMI Level 3 Organization
  – 150 people, average project size 10-20 people
  – Guidance from sister organization:
    • Decided to use SPC because dissatisfied customer/missed scheduled
    • Lead Process Engineer/SEPG monitor defects per KSLOC*
  – Set up control charts using historical data
  – Small pilot, gather new data, perform root cause analysis on outliers

*KSLOC = Thousands of Source Lines of Code
Historical data existed
Case Study A Root Cause Analysis Results—1st Situation (Outlier)

Defects per KSLOC

Inexperienced programmer

Root cause analysis conducted and recommendations reported
2nd Outlier

Inexperienced programmer
Poorly designed code

Root cause analysis conducted and recommendations reported

Defects per KSLOC

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3rd Outlier

- Inexperienced programmer
- Poorly designed code
- Poorly defined requirements

Root cause analysis conducted and recommendations reported

Defects per KSLOC
Time marches on, minimal observable performance improvements

Defects per KSLOC

Inexperienced programmer
Poorly designed code
Poorly defined requirements

Root cause analysis conducted and recommendations reported

Time marches on with no, or minimal observable performance improvements

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Case Study B Background

• Scrum organization
  – Less than 100 people, average project size 4-8
  – Dissatisfied customer/Missing schedules
  – Independent assessment
    • Observed a few retrospectives
Example Scrum Retrospective Improvements

- Do better
  - Keeping burn down charts current
  - Starting daily standups on time
  - Keeping daily standups to 15 minutes

- Challenge:
  - Why are you missing your commitments?

Backlog items often not ready
Reminder Denmark case study
Suggested Leading Edge Measure

• Story point efficiency*
  – *Estimated time to complete story/Actual time to complete story*
  – Measures flow efficiency

• Created performance baseline in one 30 day sprint (team average just below 50%)
  – Using SPC run rules threshold set at approximately 20%

*http://systematic.com/media/282227/scrum_and_cmmi___going_from_good_to_great.pdf
Case Study B Root Cause Analysis
Results– 1st Outlier

Two important resultant actions

Story Point Efficiency %

Missing test data

Team alerts Product owner and marks up a checklist as reminder
2nd Outlier

Story Point Efficiency %

- Missing test data
- Story not broken down

Team alerts Product owner and marks up a checklist as reminder
Next few sprints product owner’s competency improvements leads to customer visible team performance improvements
Case B Insights

• Need to select measures that tie to the problem you want solved

• “Story point efficiency” measure helped team’s performance in two ways
  – Visibility of flow inefficiency brought immediate attention to help resolve issues
  – Updating checklists reduced risk of future occurrences

• Team used control chart threshold as guide
  – Did not limit investigations to only outliers
Case A Insights

• “Defects per KSLOC” measure was not specific enough to help the team rapidly get to the root of the problem
  – Deeper analysis could have helped, but didn’t have data

• SEPG/PI Lead recommendations not viewed as helping real performance issues
  – Possible reasons:
    • SEPG/PI lead not viewed as part of team
    • SEPG didn’t have time or the understanding to dig deeper/stratify data
Conclusion and Next Step

• When you include improving your process as part of your process you empower your team to locate right measures leading to continual improvement without excessive bureaucratic oversight
  – Furthermore, you get the rapid high value performance payback you seek

• First experience at high maturity thinking for Case B. Next step -- discussions of other possible measures for further insights/improvements
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