SCRUMP (Scrum + RUP) and CMMI:
The Story of a Harmonious Process and Product Deployment

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Introduction

• Software Engineering Institute (SEI) Certified SCAMPISM Lead Appraiser
• SEI Authorized SCAMPISM B&C Team Lead
• Certified Scrum Product Owner
• Certified Scrum Master
• Member of the SCAMPISM B & C Development Team

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Outline

• Case Study Description
• SCRUMP (Scrum + RUP) Implementation Plan
• Implementation Results
• Lessons Learned
• Implementation Strategy Recommendations

RUP = Rational Unified Process
Case Study Background Information

- Goal: Integrate three separate tools currently in production while providing usability enhancements
- Currently in second development year
  - Year 1: Prototype development using a modified RUP framework and an experimental modeling tool
  - Year 2: Decision to not use the experimental modeling tool and transition from RUP to Scrum
- Corporate Information Technology (IT) application
- Resources: ~6 FTEs, 20 belly buttons
- End Users: Potentially anyone in the company
Agile RUP Approach (Iterations, Plan Driven)

- Business Modeling
- Requirements
- Analysis & Design
- Implementation
- Test
- Deployment

Time

Phase Gate
Agile RUP Approach (Iterations, Plan Driven)

Predictive Vision Plan Driven

FIX

Requirements

App 1
App 2
App 3

Estimate

Cost

Schedule
Agile Scrum Approach (Sprints, Value Driven)

<table>
<thead>
<tr>
<th>FIX</th>
<th>COST</th>
<th>SCHEDULE</th>
</tr>
</thead>
<tbody>
<tr>
<td>App 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>App 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>App 3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Vision
Value Driven

Adaptive

ESTIMATE
FEATURES
Agile Scrum Approach (Sprints, Value Driven)

0
INCEPTION
Business Modeling

1
ELABORATION
Requirements Analysis & Design

2
CONSTRUCTION
Implementation Test

3
TRANSITION
Deployment Adapt

Product Backlog
Features & Stories
Customer (Priority) Highest Business Value

Customer Expectation Met

Adapt Adaptive Continuous Integration

Product

5b
Scrum Implementation Strategy
### Scrum and CMMI Relationships

<table>
<thead>
<tr>
<th>Maturity Level 2 Process Areas</th>
<th>Maturity Level 3 Process Areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Requirements Management</td>
<td>• Requirements Development</td>
</tr>
<tr>
<td>• Project Planning</td>
<td>• Integrated Project Management</td>
</tr>
<tr>
<td>• Project Monitoring &amp; Control</td>
<td>• Risk Management</td>
</tr>
<tr>
<td>• Measurement and Analysis</td>
<td>• Technical Solution</td>
</tr>
<tr>
<td>• Supplier Agreement Management</td>
<td>• Product Integration</td>
</tr>
<tr>
<td>• Process and Product Quality Assurance</td>
<td>• Verification</td>
</tr>
<tr>
<td>• Configuration Management</td>
<td>• Validation</td>
</tr>
<tr>
<td>• Decision Analysis &amp; Resolution</td>
<td>• Decision Analysis &amp; Resolution</td>
</tr>
<tr>
<td>• Organizational Process Focus</td>
<td>• Organizational Process Definition</td>
</tr>
<tr>
<td>• Organizational Process Definition</td>
<td>• Organizational Training</td>
</tr>
</tbody>
</table>

- Green: Strong relationship with a little work
- Black: Some relationship with more work
- Red: Little relationship
## CMMI® Implementation Plans

### Strong CMMI® to Scrum Relationships

<table>
<thead>
<tr>
<th>Area</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Requirements Management</td>
<td>Document stories in the tool. Conduct backlog grooming (SMEs, analysts), sprint planning, peer reviews. Changes captured within the tool.</td>
</tr>
<tr>
<td>Requirements Development</td>
<td>Project vision, road map, and sprint planning, demos, retrospectives, processes documented in tool. RUP artifacts/templates (SW Dev Plan, Dev Case, etc.) used.</td>
</tr>
<tr>
<td>Project Planning</td>
<td></td>
</tr>
<tr>
<td>Project Monitoring &amp; Control</td>
<td></td>
</tr>
<tr>
<td>Integrated Project Management</td>
<td></td>
</tr>
<tr>
<td>Measurement &amp; Analysis</td>
<td>Burndown charts, capacity spreadsheets, velocity, etc. tracked and captured in the tool.</td>
</tr>
<tr>
<td>Risk Management</td>
<td>Retrospectives and sprint planning, RUP template for tracking risk/mitigation plans.</td>
</tr>
</tbody>
</table>
CMMI® Implementation Plans

<table>
<thead>
<tr>
<th><strong>Some CMMI® to Scrum Relationships</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Technical Solutions</strong></td>
</tr>
<tr>
<td><strong>Product Integration</strong></td>
</tr>
<tr>
<td><strong>Verification</strong></td>
</tr>
<tr>
<td><strong>Validation</strong></td>
</tr>
</tbody>
</table>
# CMMI® Implementation Plans

## Little CMMI® to Scrum Relationships

<table>
<thead>
<tr>
<th>Area</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supplier Agreement Management</td>
<td>N/A for this project.</td>
</tr>
<tr>
<td>Process &amp; Product Quality Assurance</td>
<td>Use RUP PPQA checklists. Issue is determining <em>when</em> to conduct PPQAs with no phase gates in Scrum. Also, consolidating current checklists is still under review.</td>
</tr>
<tr>
<td>Configuration Management</td>
<td>Use RUP CM plan template. Team tool is the CM repository/environment. CM audits with no phase gates is difficult.</td>
</tr>
<tr>
<td>Decision Analysis &amp; Resolution</td>
<td>Use the RUP DAR process and templates.</td>
</tr>
</tbody>
</table>
CMMI® Implementation Plans

<table>
<thead>
<tr>
<th>Little CMMI® to Scrum Relationships</th>
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<tr>
<td><strong>Organizational Process Focus</strong></td>
</tr>
<tr>
<td><strong>Organizational Process Definition</strong></td>
</tr>
<tr>
<td><strong>Organizational Training</strong></td>
</tr>
</tbody>
</table>
Lessons Learned – The Rewards

• Old RUP roles fit well into Scrum roles
  – Nobody lost their job
• Scrum significantly improved communication and trust between the software development team and the customer(s)
• Scrum empowered team members
  – Team members took on some project management roles
  – No waiting for approvals before moving forward
• Scrum is an excellent method for handling rapidly changing requirements
Lessons Learned – The Challenges

• Useful organizational measure contributions takes work
  – Comparison across projects is difficult
  – Inflated estimates slow productivity
  – Limited success masking

• Determining when to document is a dilemma
  – Design and product integration attributes

• Quality issues can be difficult to address
  – When to test
  – Lacking software development practices (pair programming, coding standards, etc.)
1. Upper management sponsorship will greatly decrease the time necessary to adopt a new software development method.
   
   - Process adoption is strongly encouraged
   - Conflicting project demands that impact milestones can be reprioritized
Implementation Strategies

2. A full time, experienced Certified Scrum Master (CSM) is ideal.
   - ½ time works if there are others on the team who will assist with CSM responsibilities
   - A Scrum coach could greatly improve the adoption rate
   - An experienced Scrum Master will be able to manage team dynamics through stressful times
Implementation Strategies

3. Don’t wait for the perfect plan, dive in and learn from your experiences as you go.

– But…make sure you have established code development and testing principles
– Use and modify existing organizational processes
– As new or modified processes emerge, test them through a few sprints before documenting
– Be willing to take risks; be willing to fail
Implementation Strategies

4. Determine your planning cycles

- **product vision**: yearly by the product owner
- **product roadmap**: bi-yearly by the product owner
- **release plan**: quarterly by the product owner and teams
- **iteration plan**: bi-weekly by the teams
- **daily plan**: daily by the individuals
5. If Scrum practices need to meet higher rigor requirements (CMMI, ISO, etc.), tools are highly recommended.

- Tools help to document team activities and decisions as you go (wikis, Scrum lifecycle management tools, etc.)
- Tools assist with configuration management and continuous integration builds
- Tools provide a central collaboration area for all team members
Implementation Strategies

6. Backlog grooming is critical.

- Product Backlog: Prioritized Features desired by Customer
- Select User Stories (Product Owner, Analysts)
- Implementation (Developers)
- Update Acceptance Tests (Testers, SMEs, Analysts, Developers)
- Conversations and Confirmation (Product Owner, SMEs, Analysts, Developers, Testers)
- 2 sprints ahead
- Backlog Grooming (Product Owner, SMEs, Analysts)
- Each Iteration
- Sprint Demo
7. Resist the urge to go with longer sprints at first.

- Eliminates the need to cancel a sprint because “something” isn’t going as planned
- Provides more opportunities for trying new ideas
- Allows the development team to be more responsive to changing customer needs
## Implementation Strategies

8. Establish a realistic team capacity.

<table>
<thead>
<tr>
<th>Person</th>
<th>Commitment</th>
<th>Possible Hours Available</th>
<th>Hours Away</th>
<th>Base Hours</th>
<th>Buffer</th>
<th>Planned Hours Available</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scooby Doo</td>
<td>90%</td>
<td>64.8</td>
<td>0</td>
<td>64.8</td>
<td>35%</td>
<td>22.68</td>
</tr>
<tr>
<td>Scrappy Doo</td>
<td>90%</td>
<td>64.8</td>
<td>0</td>
<td>64.8</td>
<td>50%</td>
<td>32.4</td>
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<tr>
<td>Scooby Dee</td>
<td>90%</td>
<td>64.8</td>
<td>8</td>
<td>57.6</td>
<td>50%</td>
<td>28.8</td>
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<tr>
<td>Howdy Doo</td>
<td>70%</td>
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<td>0</td>
<td>50.4</td>
<td>50%</td>
<td>25.2</td>
</tr>
<tr>
<td>Scooby Dum</td>
<td>30%</td>
<td>21.6</td>
<td>24</td>
<td>14.4</td>
<td>50%</td>
<td>7.2</td>
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<tr>
<td>Yabba Doo</td>
<td>30%</td>
<td>21.6</td>
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<td>21.6</td>
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<td>10.8</td>
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<tr>
<td>Dooby Doo</td>
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<td>21.6</td>
<td>0</td>
<td>21.6</td>
<td>50%</td>
<td>10.8</td>
</tr>
<tr>
<td>Momsy Doo</td>
<td>30%</td>
<td>21.6</td>
<td>0</td>
<td>21.6</td>
<td>50%</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>4.6</td>
<td>331.2</td>
<td>32</td>
<td>316.8</td>
<td></td>
<td>138</td>
</tr>
</tbody>
</table>

- **Hours in Sprint**: 72
- **Capacity Factor**: 50%
9. Identify a strong product owner.

- Final decisions need to be made by one, not a group
- Product owners should be trained
- Full-time product owners are ideal
- Ensure that the product owner is an integral part of the team
Implementation Strategies

10. Value your retrospectives.

- Discuss process improvements
- Create action items out identified opportunities for improvements with a goal to close the action items by the next retrospective
Contact Information

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