Scaling Agile @ Dell
Real-life Problems – and Solutions

Keep Austin Agile 2012

Geoff Meyer, geoffrey_meyer@dell.com
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Agenda

• Introductions
• Dell’s Agile Journey
• Agile @ Dell Model
  – Adaptations for Large-Scale Agile
  – Planning & Forecasting
• The Lessons of Large
Introductions
Geoff Meyer

• Dell Inc, 1998 – present
  – Responsibilities:
    › Agile Steering Co-Chair
    › Systems Management Software
    › Software Globalization / Localization
    › Offshore Development
  – Roles:
    › SW Manager, Program Manager, Test Architect

• NCR Corp. 1984 – 1998
  – SW developer, Project Lead, SW Manager

• B.S. Computer Science, San Diego State University

• Masters Engineering Management - NTU
Dell’s Agile Journey
Signs of Trouble

- Thursday’s Build
- Planning more stories into sprint than team’s velocity
- High % of carry-overs
- Inability to Automate Acceptance Tests within Sprint
- “Engineering” Stories
- Cross team interdependencies block sprint progress
- Large HW configuration validation consumes large amount of test resources
- Vendor deliveries don’t align
- Insufficient Product Owner bandwidth
Culture Transition

• Functional Responsibility to Whole Product Ownership
• Requirement Negotiation Distrust Between Marketing & Engineering
• Development vs. Test
• A different “School” of Test
• Stick to the Plan vs. Fail Early, Inspect & Adapt

1 – Scott Barber “Approaches to Software Testing: An Introduction”
Agile @ Dell Adaptations
Agile @ Dell

Core Activities

• Pre-Sprint activities:
  – Staffing
  – Training - Project tools and processes
  – CI/Build environment
  – Automation Framework and BVT

• Establish Project-wide ‘Done’ criteria

• End-to-end, short duration User Stories

• Test Automation is included in User Story acceptance criteria

• “Best Practices” Refresher Workshops for new projects
Base Model - Agile @ Dell

Pre-sprint activities

EDG (Usability)
- Wireframes
- Pre-sprints

Development
- Architecture
- Release Planning
- Pre-sprints
- HW resources

Test
- Automation FW/Tools
- Pre-sprints
- HW resources

PRP
- Define
- Plan
- Develop
- Launch

Release Plan

Sprints
1 2 3
1 2 3
1 2 3

Hardening

Feature Complete

Code Freeze

Release Exit
## Project Complexity

### Key Characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Large-Scale</td>
<td>Project consists of more than 4 Scrum teams</td>
</tr>
<tr>
<td>Interdependency</td>
<td>Requirements implemented across multiple Scrum teams</td>
</tr>
<tr>
<td>Extensive Configuration Matrix</td>
<td>Extensive HW or SW configurations</td>
</tr>
<tr>
<td>Waterfall Intersection</td>
<td>One or more components are managed using Waterfall</td>
</tr>
<tr>
<td>Geography</td>
<td>Project members are Geographically dispersed</td>
</tr>
</tbody>
</table>
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**Large-Scale**

- High-Level Architecture is completed prior to first sprint
- Conduct Follow-on Release Planning sessions
- Assign **Product Owner Proxy** to each Scrum Team
- Track Project by **Earned Business Value** (EBV)
- Incorporate Stabilization Sprints into Release Plan
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Interdependency

• Minimize the dependencies across Scrum teams

• Release Planning sync-up is conducted after each Sprint

• **Solution System Test (SST)** effort staffed and resourced
  – Ensures fidelity of intended customer usage
  – Enabler for Customer Beta Test
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Extensive Configuration Matrix

• Establish ‘reference’ configuration(s) to be used for Scrum Test efforts

• For HW-extensive configurations, staff Test-only Extended Sprints

• Extended Sprint Test begins work on previously accepted user stories across extended configurations
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Waterfall Intersection

• Perform iterative planning cycle with the Waterfall team:

1. Use initial external teams design/schedules as input into Release Planning

2. Identify User Stories that have external Dependencies

3. Update Release Plan to align all User Stories which have external Dependencies

4. Interlock on schedule misalignment

5. Repeat steps 3-4 until dependency issues are resolved.
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Geography

• Co-location of a Scrum team is *always* preferred

• Limit geographical distribution of Scrum team to no more than two time-zones

• Scrum teams within a project can be distributed
Agile @ Dell with Adaptations

Pre-sprint activities

EDG (Usability)
- Wireframes
- Pre-sprints

Development
- Architecture
- Release Planning
- Pre-sprints
- HW resources

Test
- Automation FW/Tools
- Pre-sprints
- HW resources

Release Plan

Sprints

Code Freeze

Hardening

Pre-sprints

1 2 3

N-1 N

N-1 N

Extended Sprint Test

Software System Test

Release Exit

Feature Complete

1 2 3

N-1 N

...
Planning and Forecasting
Staffing Guidelines

- PG Enterprise is organized into Functional Organizations
- Funding of an Agile Project needs to encompass team membership
- Guidelines for early stages of project concept and planning:

<table>
<thead>
<tr>
<th>Phase</th>
<th>Organization</th>
<th>Measure</th>
<th>Ratio</th>
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</thead>
<tbody>
<tr>
<td>Scrum</td>
<td>Test</td>
<td>Dev : Test</td>
<td>2 : 1</td>
</tr>
<tr>
<td>Usability</td>
<td></td>
<td>Usability: Scrum Teams</td>
<td>1 : 1.5</td>
</tr>
<tr>
<td>Documentation</td>
<td></td>
<td>Doc : Scrum Teams</td>
<td>1 : 3</td>
</tr>
<tr>
<td>Extended Sprint Test</td>
<td>Test</td>
<td>Test : Scrum Teams</td>
<td>1.5 : 1</td>
</tr>
<tr>
<td>Solution System Test</td>
<td>Test</td>
<td>Test : Scrum Teams</td>
<td>1 : 1.5</td>
</tr>
</tbody>
</table>
The Lessons of ‘Large’

*Courtesy: Gulliver’s Travels (2010)*
The Lessons of ‘Large’

1. Whole Team approach
2. Embrace Inspect and Adapt
3. Co-location is essential
   - Collaborative space is even better
4. Establish a Culture of Automation
   - Across Development and Test
5. Establish Dev/Test ratio
6. Focus on Earned Business Value
7. Scale the Product Owner
Resources

- Agile Manifesto

- Articles:
  - Agile Adoption – Vital Behaviours and Influence Strategies by Steven Rogalsky
  - Scrum Primer – Scrum Foundation

- Books:
  - Scaling Software Agility: Best Practices for Large Enterprises – Dean Leffingwell
  - Agile Project Management: Creating Innovative Products – Jim Highsmith
  - Drive – Daniel Pink

- Presentations:
  - Scaling Software Agility: Agile Portfolio Management – Dean Leffingwell
  - Approaches to Software Testing: An Introduction – Scott Barber
Questions?
Backup
# What is Solution System Test (SST)?

<table>
<thead>
<tr>
<th>IS</th>
<th>IS NOT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Requirements-based</td>
<td>Functional testing</td>
</tr>
<tr>
<td>Customer-usage based</td>
<td>Build verification</td>
</tr>
<tr>
<td>Workflow-based Interoperability validation</td>
<td>First time integration</td>
</tr>
<tr>
<td>Three phased approach</td>
<td>Performance benchmark testing</td>
</tr>
<tr>
<td>1. Test Design/Development</td>
<td></td>
</tr>
<tr>
<td>2. Test Execution and Regression</td>
<td></td>
</tr>
<tr>
<td>3. Final Regression</td>
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</tbody>
</table>

### Pre-SST
- Workflow Design
- Test Analysis
- Test Design
- Test Development

### SST
- Automation Development
- Test Execution
- Regression Testing

### Hardening
- Test Regression
- Final Validation

### FV
Extended Sprint Test
*Primarily used on SW for HW projects*

- Scrum team establishes Acceptance criteria
- Scrum Test members identify all Test scenarios
- Scrum team owns all test case execution against reference configuration(s)
- Extended Sprint Test team is delegated the Test Execution
- Defects are top priority of the Scrum team

<table>
<thead>
<tr>
<th>Configurations</th>
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<tbody>
<tr>
<td>Positive</td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Negative</td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
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<tr>
<td>Boundary</td>
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<td>X</td>
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<tr>
<td>Stress</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Scalability</td>
<td></td>
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<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Concurrency</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Globalization</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

Candidate for Extended Sprint Test
Roles/Responsibilities

Product Owner Council (Customer Team)

- Product Management
- Epic Prioritization & Business Value
- Cascade Vision & Themes to team
- Represents Customer - Profiles/Roles
- Requirement Acceptance

Product Owner

- Facilitate, Remove Scrum impediments

Product Owner Proxy
- 1 per Scrum

Scrum Master
- 1 per Scrum

Development
- 4-5 per Scrum

Test
- 1 : 1.75

InfoDev
- 1 per 3 scrum team

UI
- 1 per Scrum

Scrum teams

Customer Team is the term used by Lisa Crispin and Janet Gregory in their book: "Agile Testing: A Practical Guide for Testers and Agile Teams"
## Success Factors for Test Automation

<table>
<thead>
<tr>
<th>Critical Tasks</th>
<th>Dev</th>
<th>Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identification of Acceptance Tests for a User Story that are automatable within Sprint</td>
<td>Shared</td>
<td></td>
</tr>
<tr>
<td>Design completeness and artifact updates early in Sprint</td>
<td>Primary</td>
<td></td>
</tr>
<tr>
<td>Feature Design/Development that enables Test Automation (hooks, object ID’s, etc)</td>
<td>Shared</td>
<td></td>
</tr>
<tr>
<td>Automate-first mindset during Test Case analysis and design</td>
<td>Primary</td>
<td></td>
</tr>
<tr>
<td>Unit Test Development and execution (automation preferable)</td>
<td>Primary</td>
<td>Backup</td>
</tr>
<tr>
<td>Daily Testable builds and Build Verification</td>
<td>Shared</td>
<td></td>
</tr>
<tr>
<td>Notification of changes that could impact automation</td>
<td>Primary</td>
<td></td>
</tr>
<tr>
<td>SW Development skill-set within Validation organizations</td>
<td>Primary</td>
<td></td>
</tr>
<tr>
<td>Test Automation Design reviews</td>
<td>Shared</td>
<td></td>
</tr>
<tr>
<td>Functional Test Development and Execution</td>
<td>Backup</td>
<td>Primary</td>
</tr>
</tbody>
</table>
Product Owner Proxy

Responsibilities

• Understands the customer needs and value of each story
• Agent of Product Owner
  – Is empowered to make decisions
• Develops User Stories
• Reviews & prioritizes backlog
• Available for further story elaboration
• Participates:
  – Sprint Planning
  – Scrum standups
  – Retrospectives

Skill profile of Good PO Proxy

• Respected by the Product Owner
• Enjoys collaborating with team
• Understands what is really important to customer
• Ability to balance features, costs, time and quality for optimal outcome.
• Good negotiation skills
• Understands the technical process and technologies
Earned Business Value

- Allows us to track the actual business value delivered during development
- Requirements are assigned Business Value points
- Business Value points are earned at requirement completion
- The release plan projects when requirements will be completed