Ground System Architectures Workshop
GMSEC SERVICES SUITE (GSS)
An Agile Development Story

Vuong Ly
NASA
Goddard Space Flight Center
Software Engineering Division
vuong.t.ly@nasa.gov

Session 11E:
Adopting Agile Ground Software Development
March 15th 2017
Los Angeles, California
Agenda

• GSS Background
• Brief Intro to Agile
• Why Agile and GSS Challenges
• Takeaways
Intro to Agile

• What is Agile Software Development?

“Describes a set of principles for software development under which requirements and solutions evolve through the collaborative effort of self-organizing cross-functional teams. It advocates adaptive planning, evolutionary development, early delivery, and continuous improvement, and it encourages rapid and flexible response to change.”

Source: https://en.wikipedia.org/wiki/Agile_software_development

• Methodologies

- Scrum
- Kanban
- Feature Driven Dev.
- Adaptive System Dev.
- Dynamic Systems Dev.
- Lean Software Dev.
- Crystal Clear
Agile Setup

- Manage work items with IBM Rational Team Concert. Specifically the Change Management module leveraging Scrum Agile project template within RTC (Youtube - Rational Team Concert v4.0.2 ALM)
- Team roles:
  - Product Owner
  - Scrum Master
  - Team Member
  - Stakeholder
- Sprint cycle:
  - 4 weeks
  - Starts at the beginning of the month
- M-W-F stand-up meetings (15 mins)
- Story points:
  - On the order of minutes (XS)
  - Up to one day (S)
  - Couple of days (M)
  - Up to one week (L)
  - Up to two weeks (XL)
- Sprint Review - typically at the end of the month or the beginning of the next month
- Post Sprint Review, Sprint Retrospective are combined into one at the end of each Sprint
- Sprint Planning at the beginning of each Sprint
- Align our major releases with GMSEC releases (two times a year)
Why Agile?

- Engage with the stakeholders early and throughout the development process to make sure that the end product meets their expectations.
Why Agile?

GPM GPM Nominal
Successful power on with 120V supply set to 120.5 Volts. Surge current reached 1.7 Amps

Severity: Nominal
Time: 2017-038-02:43:07
Mission: GPM
Satellite: GPM

Enter to Submit or Click to Submit

GSAW 2017 Session 11E: Adopting Agile Ground Software Development
GSS An Agile Development Story
Challenges

• If one of your stakeholders had a bad pre-conceived notion of Agile...
  – Then the team needs to prove the value of the process
• Some common misunderstandings
  – Agile is anti-planning and undisciplined
    ▪ Where’s your 18 month plan?
  – Agile teams don’t do documentation
    ▪ Where are your formal requirements, design document, test plans, test procedures?
At the heart of our Agile development practice is Continuous Integration.
Why Agile?

- Allow for change
  - Opportunity to update/reprioritize plans based on customer inputs
  - Personnel flexibility for non-full time team members
- Cross functional teams
  - Encourage team members to take on different roles
  - Minimize the “single expert” problem
- Predictable costs and schedule
  - Understand your team productivity and level of effort to complete tasks
- Immediate feedback - bidirectional

GSAW 2017 Session 11E: Adopting Agile Ground Software Development
GSS An Agile Development Story
Why Agile?

- Focus on users and providing them business value
  - Stakeholders! Stakeholders! Stakeholders!

Is that what you called a Demo?

GSAW 2017 Session 11E: Adopting Agile Ground Software Development
GSS An Agile Development Story
Challenges

- Maintaining up-to-date documentation
- Maintaining up-to-date automated testing environment
- Ensuring stakeholders consistent involvement
- Helping management to understand the benefits of the Agile methodology
Takeaways

• Early and frequently stakeholders involvement and buy-in is essential
• Use agile techniques to build in quality and automate processes
• Happy development teams produce better software
• Agile is not the wild-west: it requires a lot of leadership, communication, and discipline to be successful
<table>
<thead>
<tr>
<th>Acronym</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANSR</td>
<td>Alert Notification System Router</td>
</tr>
<tr>
<td>CAT</td>
<td>Criteria Action Table</td>
</tr>
<tr>
<td>E2E</td>
<td>End-to-End</td>
</tr>
<tr>
<td>GEDAT</td>
<td>GMSEC Environment Diagnostic Analysis Tool</td>
</tr>
<tr>
<td>GOTS</td>
<td>Government Off-The-Shelf</td>
</tr>
<tr>
<td>GPD</td>
<td>GMSEC Parameter Display</td>
</tr>
<tr>
<td>GRASP</td>
<td>GMSEC Remote Data Access Tool</td>
</tr>
<tr>
<td>GREAT</td>
<td>GMSEC Reusable Event Analysis Toolkit</td>
</tr>
<tr>
<td>IT</td>
<td>Integration Test</td>
</tr>
<tr>
<td>RAA</td>
<td>Room Alert Adapter</td>
</tr>
<tr>
<td>SA</td>
<td>System Agent</td>
</tr>
</tbody>
</table>