Hardened Agility:
Deploying Agile at a Defense Contractor

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My Background

• **Education**
  – BS, Computer Science and Math, University of Arizona
  – MBA, Arizona State University

• **14 years at General Dynamics (GD)**
  – Software developer, team lead
  – Company agile champion/coach
  – IT project manager

• **10 years using/promoting agile at GD**
  – Used agile for developing gov’t encryptors
  – Architected company agile framework
  – Leading agile initiative within IT
Defense Industry Obstacles to Agile

• Realities of defense contracting:
  – Government business is highly regulated
  – Customers provide statement of work at project outset
  – Contractors must show proof of work done (e.g. traceability, earned value)

• This tends to encourage:
  – Processes and tools over individuals and interactions
  – Comprehensive documentation over working software
  – Following a plan over responding to change

• Whereas, the Agile Manifesto encourages the opposite

• It’s a tough environment for agile processes
Our Agile Framework

• We’ve evolved an agile framework over the last 10 years
• Why we value this framework:
  – Has agile principles at its core, and has been proven on real defense contracts
  – Extends the benefits of agile beyond software (e.g. systems engineering)
  – Enables formal requirements traceability in an agile friendly way
  – Enables earned value like status without traditional planning

• The framework itself is “tool agnostic”
• But we have a custom configuration of IBM’s CLM suite for it
  – We do very cool stuff in the CLM tool
  – But the tool is not the focus on this presentation

• The next 4 slides summarize key methods of our framework…
Method 1: Upfront definition of use cases / epics

• At the project outset, the team creates a use case model for the end product
• Serves as breadth-over-depth, shared vision for what the team is building
• Use cases become the agile “epics”

• Benefits of this method:
  – Systems engineers know use cases
  – Efficient way for coming up with good epics
  – Epics are useful in requirements analysis
  – Epics are useful in project planning/tracking
Method 2: Iterative analysis and development

- During execution, we acknowledge analysis as distinct from development
- The former feeds the latter
- Both are iterative and priority driven

Benefits of this method:
- Supports long lead system analysis without making development wait for everything
- Empowers both efforts with independent but complementary backlogs
- Lends itself to lean management principles (story inventory, pull only needed analysis)
Method 3: Story derivation via requirements analysis

• In the analysis iterations, the team derives requirements and test cases for a *subset* of customer requirements

• Stories for the development team are derived in test driven manner

• Derived artifacts are organized by epic

• Benefits of this method:
  – Provides traceability needed by gov’t contracts (built out over a series of iterations)
  – Creates quality stories for agile development
  – Organization by epic keeps everything grounded in the shared product vision
Method 4: Tracking performance to an agile plan

- Use a standard agile burn-up chart to track overall progress of development
- Provide story point estimate for project by estimating size of each epic
- Roll-up actual points by epic

Benefits of this method:
- Burn up chart provides EV like % complete
- Using epics, teams can know how far along they are without a predefined work sequence
- Chart focused on development progress encourages leaning out of analysis “overhead”
- Roll-up to epic made easy by methods 1 & 3
Closing Thoughts

• Certain realities of defense contracting constrain agility

• In some areas, changing for the sake of agile may not be worth it
• But other areas are ripe for reform
• The optimal solution is probably an intelligent “hybrid-agile” technique

• Finding that optimal hybrid will require real-world practice
• Contractors and customers will need to make coordinated changes
• There will be mistakes made and lessons learned – I speak from experience!

• But we’ve proved that adopting agile methods is worth it…
• …even in the Defense Industry