Agenda

- The Problem
- An Agile Story
- Contracts vs Value
- Scrum (An Agile Project Management Framework)
- Traditional Earned Value Management
- Agile Earned Value Management (AgileEVM)
- Project Case Study
- Open Discussion

*Slides available via slideshare.net or gettingagile.com
Robert Gates, the United States Secretary of Defense, in a September 2008 speech, said, “Our conventional modernization programs seek a 99% solution in years. Stability and counterinsurgency missions—the wars we are in—require 75% solutions in months.
This is the best, simplest, easiest to use application we have ever gotten in both Customer Care and the Retail Stores! Whatever you all did, I want more of that!
Pilot Agile Team Delivered Great Value

- Employee Satisfaction
- Customer Satisfaction
- Cost Savings
- New Revenue through efficiency

Value
- Cost Savings
- New Revenue
- Compliance
- Employee Satisfaction
- Customer Satisfaction
- Shareholder Value
- Revenue Retention
Value in DoD: How is it measured?

- # Lives saved
- Simple to Use
- Secure
- ?

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The primary purpose of the [EVMS] system is to support program management*

* Earned Value Management Systems ANSI/EIA-748-B-2007
Is Value Defined in Contracts?

- Time and Materials (T & M)
- Fixed Price
- Cost Plus Incentive Fee
- IDIQ/Delivery orders
  - or task orders

These are cost-based!

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The Value Triangle

- **Value**
  - **Strategic**
  - **Quality**
  - **Constraints**
    - (Schedule, Cost, Scope)

Source: Jim Highsmith
We are uncovering better ways of developing software by doing it and helping others do it. Through this work we have come to value:

- Individuals and interactions over processes and tools
- Working software over comprehensive documentation
- Customer collaboration over contract negotiation
- Responding to change over following a plan

That is, while there is value in the items on the right, we value the items on the left more.
Complexity Requires Adaptive Planning

- It is not possible to completely specify an interactive system.
  Wegner’s Lemma, 1995

- Uncertainty is inherent and inevitable in software development processes and products.
  Ziv’s Uncertainty Principle, 1996

- For a new software system the requirements will not be completely known until after the users have used it.
  Humphrey’s Requirements Uncertainty Principle, c. 1998
Scrum (An Agile Project Management Framework)

- Stack Ranked Prioritization based on Business Value and risk
- Self organizing, cross-functional teams
- Definition of Done
- Potentially Shippable Increments
- Velocity
- Continuous Improvement
Earned Value Management

Management Reserve

Total Allocated Budget

PMB
Performance Management Baseline

Plan Value
(PV)

Actual Cost
(AC)

(EV)
Earned Value

Time

Now

Completion Date

Over Budget

EAC
Estimate at Complete

Projected Slippage

Total Allocated Budget

Time

$
### EVM Performance Indicators

#### Cost Performance Index (CPI=EV/AC)

<table>
<thead>
<tr>
<th>CPI &lt; 1</th>
<th>CPI = 1</th>
<th>CPI &gt; 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Over Budget</td>
<td>On Budget</td>
<td>Under Budget</td>
</tr>
</tbody>
</table>

#### Schedule Performance Index (SPI=EV/PV)

<table>
<thead>
<tr>
<th>SPI &lt; 1</th>
<th>SPI = 1</th>
<th>SPI &gt; 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Behind Schedule</td>
<td>On Schedule</td>
<td>Ahead of Schedule</td>
</tr>
</tbody>
</table>
Strengths of EVM

- Integrates cost and schedule management
- Forecasts in financial units based on units used for actual cost
- Decades of use
- Part of PMBOK (ANSI/PMI 99-001-2008)
- Part of EVMS (ANSI/EIA-748-B-2007)
Weaknesses of Traditional EVM

- Typical implementations expect everything fully defined up front
- No assertion of quality
- Claiming value earned on intermediate work products
A planning package is a holding account (within a control account) for budget for future work that it is not yet practicable to plan at the work package level. The planning package budget is time-phased in accordance with known schedule requirements (due dates) for resource planning, and the plans are refined as detail requirements become clearer and the time to begin work draws nearer. A program may elect to break the work assigned to a control account into smaller groupings of tasks, i.e., multiple planning packages, for internal planning and control reasons.

3.5.11 Planning Package Conversion

- There is no standard advance planning look-ahead period (i.e., a planning “horizon” or “window”) for conversion of planning packages into work packages that is appropriate for all programs or conditions. Each organization must determine its own policies in this regard.

Mathematically proven that Forecasts based on average velocity (story points) $\equiv$ estimate at complete EAC (dollars)

Key Assumption: The ratio of (story points completed)/(total story points in a release) is a good measure of Actual Percent Complete

Sulaiman, Barton, Blackburn “AgileEVM - earned value management in Scrum projects,” 2006
http://ieeexplore.ieee.org/xpl/freeabs_all.jsp?arnumber=1667558
AgileEVM Key Data Elements

- **Release Baseline**
  - Budget (BAC)
  - Initial Scope
  - Start Date

- **Each Iteration (Sprint)**
  - Points accepted by Product Owner
    - meets Definition of Done
  - Points add or removed from release scope
  - Actual Cost
Now we can focus on Value...
AgileEVM can be used to Support Agile Contracts

- Because the performance measurement baseline (PMB) is expressed as “number of story points planned” rather than at the level of specific tasks, it allows course corrections to be made without disruption or re-baselining of the PMB.

- This addresses the criticism expressed in the Defense Acquisition Reform Findings and Recommendations (DARFAR) report regarding the inability of traditional EVMS to identify issues related to “contract requirements that utterly failed to meet warfighter needs” [House Armed Services Committee 2010].
Release Forecasting using Agile Charts
Release Forecasting using AgileEVM

- Integrated Cost and Schedule information provides better insights than schedule alone

### Forecasts based on 158 points left in this release

<table>
<thead>
<tr>
<th>Item</th>
<th>Plan</th>
<th>Optimistic</th>
<th>Pessimistic</th>
<th>When Volatility is Removed</th>
</tr>
</thead>
<tbody>
<tr>
<td>To Complete Estimated Cost</td>
<td>$81,209</td>
<td>$194,509</td>
<td>$314,319</td>
<td>$170,035</td>
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<tr>
<td>To Complete Iterations</td>
<td>3</td>
<td>11.1</td>
<td>18</td>
<td>9.7</td>
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<tr>
<td>At Complete Estimated Cost</td>
<td>$314,242</td>
<td>$359,472</td>
<td>$479,282</td>
<td>$334,998</td>
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</table>
Done, or Not Done
Getting Everything in the Product Backlog and Focusing Team
Re-baseline Release to Fit Reality causes SPI = 1 and CPI=1

<table>
<thead>
<tr>
<th>Summary Status</th>
<th>Item</th>
<th>Plan</th>
<th>Actual</th>
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</thead>
<tbody>
<tr>
<td>State of Release</td>
<td>-</td>
<td></td>
<td>In Progress</td>
</tr>
<tr>
<td>Percent Complete</td>
<td>108%</td>
<td></td>
<td>98%</td>
</tr>
<tr>
<td>Size of Release (Points)</td>
<td>488</td>
<td></td>
<td>1,140</td>
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<tr>
<td>Average Velocity</td>
<td>19</td>
<td></td>
<td>35</td>
</tr>
<tr>
<td>Cost Performance Index (CPI)</td>
<td>1.0</td>
<td></td>
<td>1.02</td>
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<tr>
<td>Schedule Performance Index (SPI)</td>
<td>1.0</td>
<td></td>
<td>0.91</td>
</tr>
</tbody>
</table>
Focus on delivering value
Constraints inform, not dictate outcomes
Quality must be part of the decision process
AgileEVM helps communicate by translating points to dollars
  • Can provide alternatives to contracting challenges
Brent Barton

- President: Agile Advantage, Inc.
- Former CTO, Development Manager, PMO Manager, Agile Coach, Mentor, Certified Scrum Trainer, ScrumMaster, Product Owner
- Active practitioner delivering value using Agile and helping others do it; from small Product companies to very large organizations

- Articles
  - “Manage Project Portfolios More Effectively by Including Software Debt in the Decision Process”, Cutter Journal 2010
  - “Implementing a Professional Services Organization Using Type C Scrum”, IEEE
  - “Establishing and Maintaining Top to Bottom Transparency Using the Meta-Scrum”, AgileJournal
  - “All-Out Organizational Scrum as an Innovation Value Chain”, IEEE

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Where Agile Meets Business