ACTION & INFLUENCE

Agile and Earned Value Management

EVM Quick Review 1/2

- Earned value management (EVM) is used for measuring project performance and progress in an objective manner:
  - Measurements of scope, schedule, and cost
- EVM can provide accurate forecasts and project performance problems
  - Positive predictors of project success with early EVM use

$$EV = \sum_{\text{Start}}^{\text{Current}} PV(\text{Completed})$$

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EVM Quick Review 2/2

- Essential features of EVM include:
  - *Requirements to BACKLOG - This is a must*
  - Planned Value (PV) or valuation of planned work
  - Quantification of completed work or Earned Value (EV)
- More complex additions can be added to EVM:
  - Forecasts and cost performance
  - Schedule performance

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EVM - The Benefits

- Avoid cost and schedule overruns
  - Early visibility into scope (sometimes flexible), schedule, cost, and quality issues so you can take action sooner
- Realize business value sooner
  - Take action from graphical trends in development
- Direct development budget dollars to highest-value projects

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AgileEVM 1/2

- Data points necessary for AgileEVM:
  - Budget at Complete - Targeted budget for release? ($)
  - Sprint Length - Same length of time (consistency)
  - Planned Sprints - How many sprints for the release?
  - Planned Release Story Points - Total estimated story points for the release?
  - *Remember, a FULL BACKLOG is necessary.*

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AgileEVM 2/2

- Once the initial baseline is established, measurement of progress must have defined boundaries:
  - Current sprint number
  - Number of story points actually completed
  - Number of story points added/removed from release
  - Actual cost ($/hours) - Employee cost/rate

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AgileEVM Definitions

Earned Value Term	Definition
Planned Value (PV)	The value of the work planned to be accomplished based on the budget (in dollars or hours)
Earned Value (EV)	The integrated value of work actually accomplished based on the budget (in dollars or hours)
Actual Cost (AC)	Actual Cost incurred for that increment of work
Budget At Complete (BAC)	The budget assigned to complete the work
Estimate To Complete (ETC)	The forecasted amount to complete remaining work (in dollars or hours) based on past performance.
Estimate At Complete (EAC)	The forecasted total amount for all work in the project plan based on past performance.

http://www.infoq.com/articles/agile-evm

AgileEVM Metrics

Metric	Formula	Metric Analysis
Planned Value	BAC * Planned Percent Complete	The planned value indicates how much value was planned to have been generated by a particular milestone or point in time.
Earned Value	BAC * Actual Percent Complete	The earned value indicates how much value has actually been generated at a particular milestone or point in time.
Cost Performance Index (CPI)	EV/AC	This metric indicates how many cents have been "earned" out of every dollar spent. It measures cost efficiencies.
Schedule Performance Index (SPI)	PV/AC	This metric measures schedule efficiency. It indicates how fast you are progressing against the rate of progress planned.
ETC	(BAC – EV)/CPI	This metric is the forecast amount to complete the remaining work.
EAC	BAC / CPI Or AC + ETC	Forecasted cost for the total planned work.

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AgileEVM Equations

Item	Definition
Budget At Complete (BAC)	The planned amount you expect to spend
Actual Cost (AC)	The actual cost to complete the work
PRSP	Planned Release Story Points for the release. Story points are defined at the Product Backlog level.
Expected Percent Complete (EPC)	Current Sprint(n) / Total planned Sprints
Actual Percent Complete (APC)	Story points completed / Total planned Story points
Planned Value (PV)	PV = BAC * EPC
Earned Value (EV)	EV = BAC * APC
Cost Performance Index (CPI)	CPI = EV / AC
Schedule Performance Index	CSPI = EV/PV

http://www.infoq.com/articles/agile-evm

Agile & EVM?

- For DoD - Require 32 EVM Criteria of ANSI / EIA-748-B before EV can be initiated
- Agile methods line up to 11 of those 32 points
  - 1,2,5,6,7,8,16,23,25,26,28…
- “Naive/Fictitious schedules and estimates committed far to early in project?” (Scott Ambler, IBM)
- EV can forecast Estimate at Completion in units meaningful to the funder - $$$

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Matching them Up

#	EVM Criteria	Agile Approach
1	Define WBS	Features and Stories define tasks
2	Identify Organization	Self organizing teams
5	Integrate WBS and OBS	Self organized teams with a customer
6	Schedule Work	Iterations and Releases
7	Identify Products & Milestones	Working software at the end of iterations
8	Set time phased budget	Fixed length iterations and releases
16	Record direct costs	Fixed staff = Level of Effort
23	Determine variances	Velocity measures missed features
25	Sum data and variance	Missed features moved to next iteration
26	Manage action plans	Replan missed features, adjust velocity
28	Incorporate changes	Replan missed features, adjust velocity

http://www.slideshare.net/galleman/successfully-integrating-agile-and-earned-value

Earned Value Management	+	Agile
Measures of progress in units of "physical percent complete."		Each iteration produces 100% working products.
Forecast of future performance provided by past performance.		Measure of performance in units of product produced.
A systems approach to the development of products and connecting Cost, Schedule, and Technical Performance.		Increasing fidelity of product and problem understanding takes place after each iteration and release.

These Appear To Be Conflicting, But They Are Not.
Both measure performance in tangible ways

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Popular Myths of Traditional Methods (Agile's Foil) †	Actual Fact in DoD Acquisition
Assume all aspects can be defined prior to the start of work	5000.02 incremental milestones with IMP Events, Accomplishments and Criteria
Requirements are frozen	Rolling waves within each milestone
Change is discouraged	Change managed as capabilities evolve
Not good at managing the unknown	DoD defines technical and programmatic risk management
Provides comfort in a Plan	IMP / IMS evolves with rolling waves
Uncertainty begets uncertainty	Probabilistic risk management with specific handling strategies

† Borland Agile briefing, and typical of the Agile Community

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These Business Management Practices Can Be Met …

…By Connecting Agile and Earned Value Management

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Bottom Line?

- Yes. It can work.
- It's tough.
- A full backlog is necessary…
  - Requirements given from (Prime/Govt) need to be broken down into a backlog of expectations
  - … possibily even before contract award is given
  - Cost+ contracts work well here
- Meaningful metrics should always allow us to make better decisions as a business
  - If not, then don't use them.

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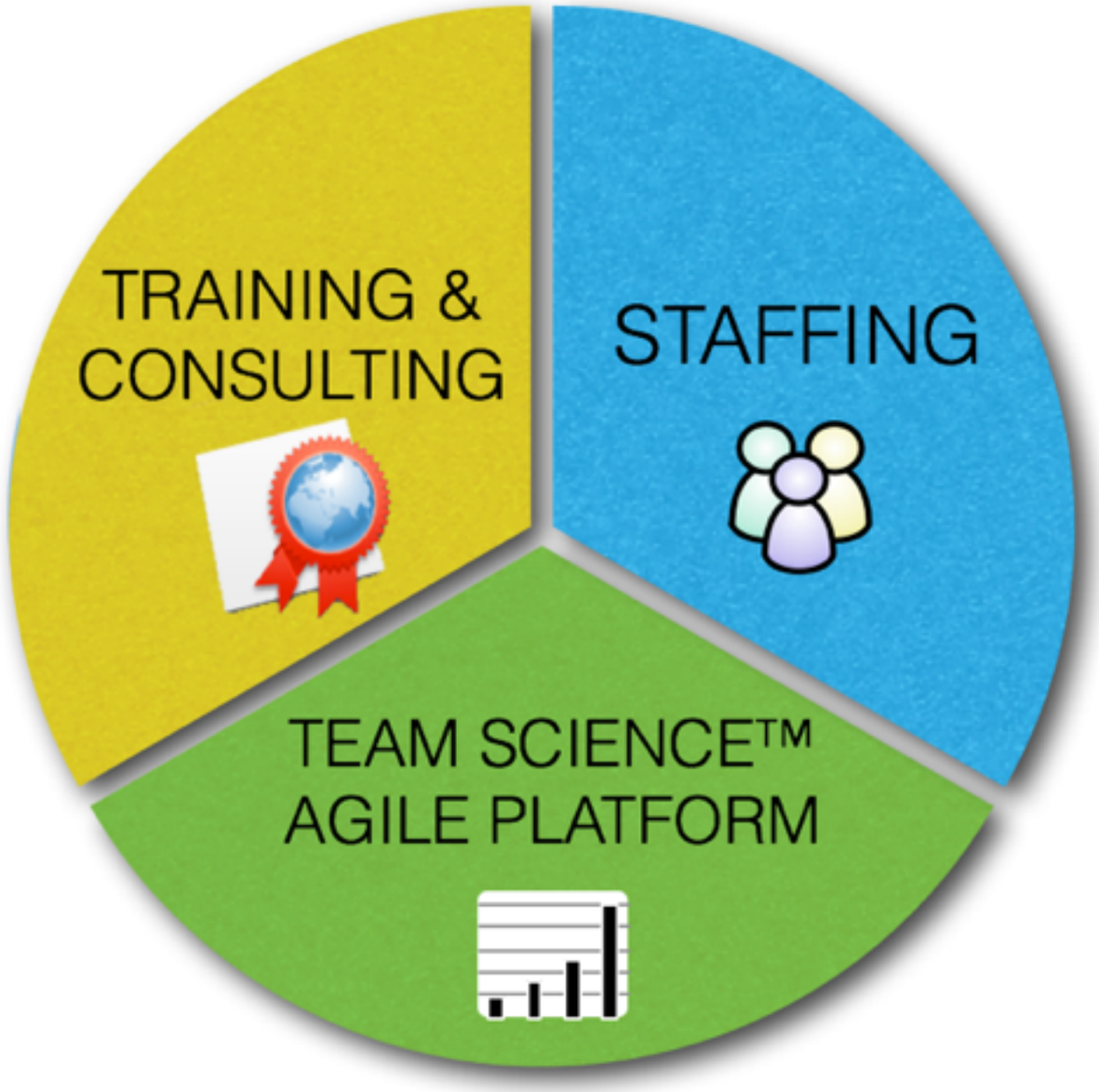
Action & Influence Clients

What does Action & Influence do?

AGILE TRANSFORMATION SERVICES



Please contact **Jenny Mintz**, *VP of Talent and Development* for any staffing needs:
- Looking for a new opportunity
- Looking for candidates for your company

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- Organizational Consultant and Certified Scrum Trainer (CST)
- 15+ Years in Software Development
  - Govt/DoD <-> Fortune Companies
- *The Agile Pocket Guide* - *A Quick Start to Making Your Business Agile* (Wiley, 2012)
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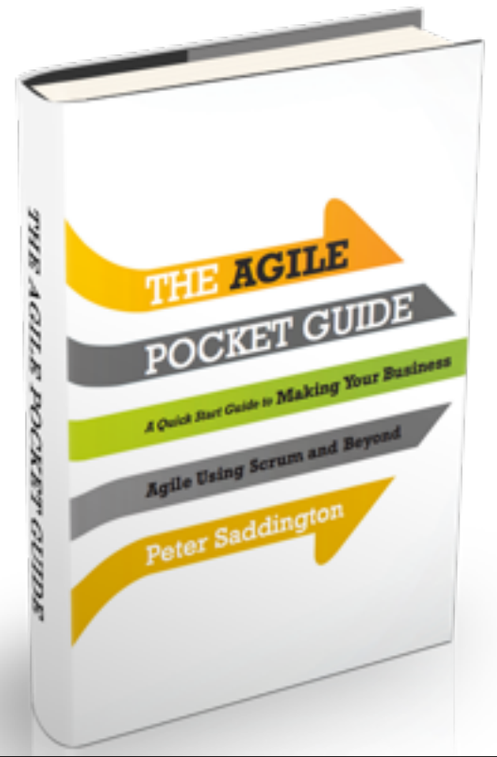

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http://www.linkedin.com/groups/Action-Influence-Scrum-Group-Alumni-4857483/about