The Agile Project Management (PM) Tool

Effectively Managing the Three Dimensions of an Agile Project: Cost, Schedule, and Scope

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International Cost Estimating
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What is "Agile" software development?

- ▶ What is "Agile" Software Development?
  - – A software development philosophy based on iterative and incremental development, where requirements and solutions evolve through collaboration between self-organizing, cross-functional teams
  - – Promotes adaptive planning, evolutionary development and delivery, a time-boxed iterative approach, and encourages rapid and flexible response to change

- ▶ Agile Principles
  - – Customer satisfaction through early and continuous delivery of valuable software
  - – Welcoming changing requirements, even late in development
  - – Deliver working software frequently
  - – Working software is the primary measure of progress

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

*Manifesto for Agile Software Development © 2001

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Agile Concepts and Terms

- **User Stories**: A high-level definition of a requirement, containing just enough information so that the developers can produce a reasonable estimate of the effort to implement

- **Complexity Points**: Quantification of a User story's scope or effort, a relative measure of complexity

- **Sprint / Iteration / Release**: *Sprint* - Fixed time-box in which development occurs (usually 2 - 4 weeks); *Iteration* - Minor subset of requirements designed to be released to the user community; *Release* - Multiple Iterations that fulfill a major subset of user requirements

- **Velocity:** Performance / productivity measure that indicates progress toward capability delivery (i.e., Complexity Points completed per sprint)

- **Project / Sprint Backlog:** A prioritized database that summarizes the User Stories / Requirements yet to be complete for the entire project

- **Burndown:** The concept, often shown as a graph over time, of working off or "earning" Complexity Points toward iteration or delivery completion

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What is the Agile PM Tool?

▸ Innovative, scenario-based Excel model that tracks project progress and projects future performance

▸ Provides dynamic outputs for cost, schedule, scope, and performance based on user inputs and historical performance metrics

▸ Identifies possible COAs for addressing projected cost/schedule shortfalls

▸ Provides innovative visualization tool for prioritizing remaining work

▸ Performs what-if excursions for point growth analysis

▸ Incorporates uncertainty analysis with confidence level based outputs
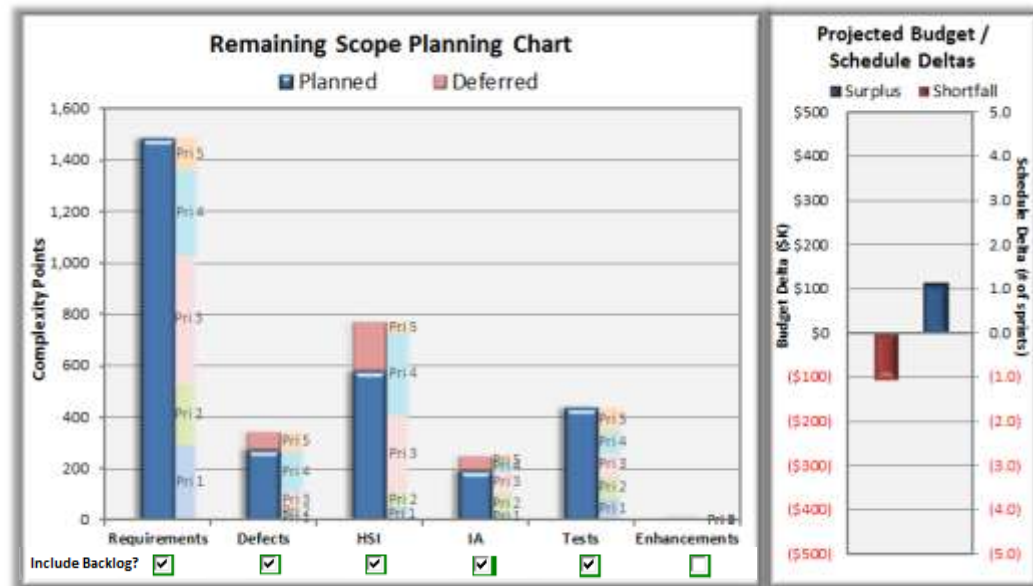
The model consumes historical financial/SW data and provides various COAs for managing future cost, schedule, and scope

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The Agile PM tool provides several benefits

▸ Utilizes metrics relevant to the development efforts; most likely being reported in performer reports / CDRLs

▸ Enables PMs to prioritize remaining scope while considering budget and schedule constraints simultaneously

▸ Produces dynamically adjusted COAs for what-if scenarios, uncertainty analysis, and confidence levels projections

▸ Produces in-progress metrics that makes it easier to assess project health / progress
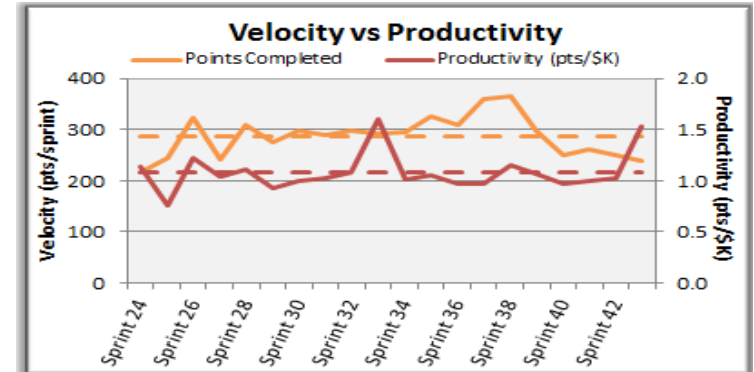
▸ Relates **effort** to complexity, not software size, which is more intuitive to engineers that help scope the effort

$$PM = A \times Size^E \times \bigodot_{i=1}^{n} EM_i$$

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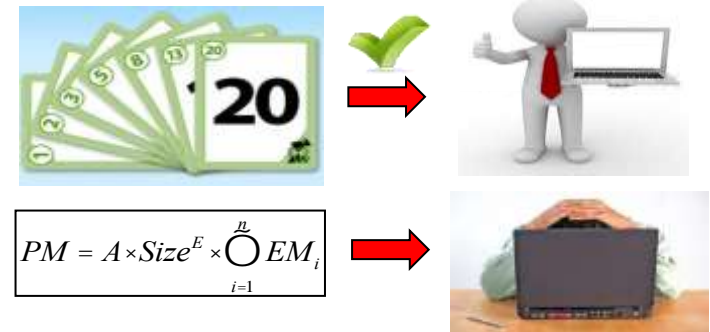
There are also several challenges in implementing Agile PM Tool

▶ Many projects do not require performer to maintain or report data needed for input into the tool

▶ Each project likely has a different structure for backlogs that requires customization of the tool

▶ Mapping lower-level artifacts (stories, IA, HSI, etc) to requirements is often difficult, which can increase complexity of modeling within the tool

▶ Importing historical data into the tool is a time-consuming, manual process

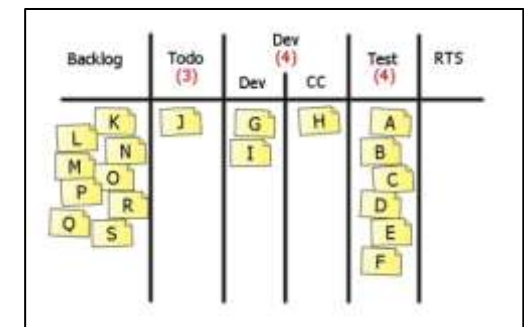▶ Subjectivity in complexity scoring and accounting for unplanned effort adds uncertainty to projections

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▸ Agile PM Tool Demo

Agile PM Tool is an valuable resource that can enable PMs to more effectively monitor and manage their Agile software projects

▶ Delivers comprehensive, yet dynamic analysis giving PM unprecedented insight into all aspects of project progress

- Cost

- Schedule

- Scope

▶ Provides innovative, intuitive input and visualization tools that enable objective, informed management decision making
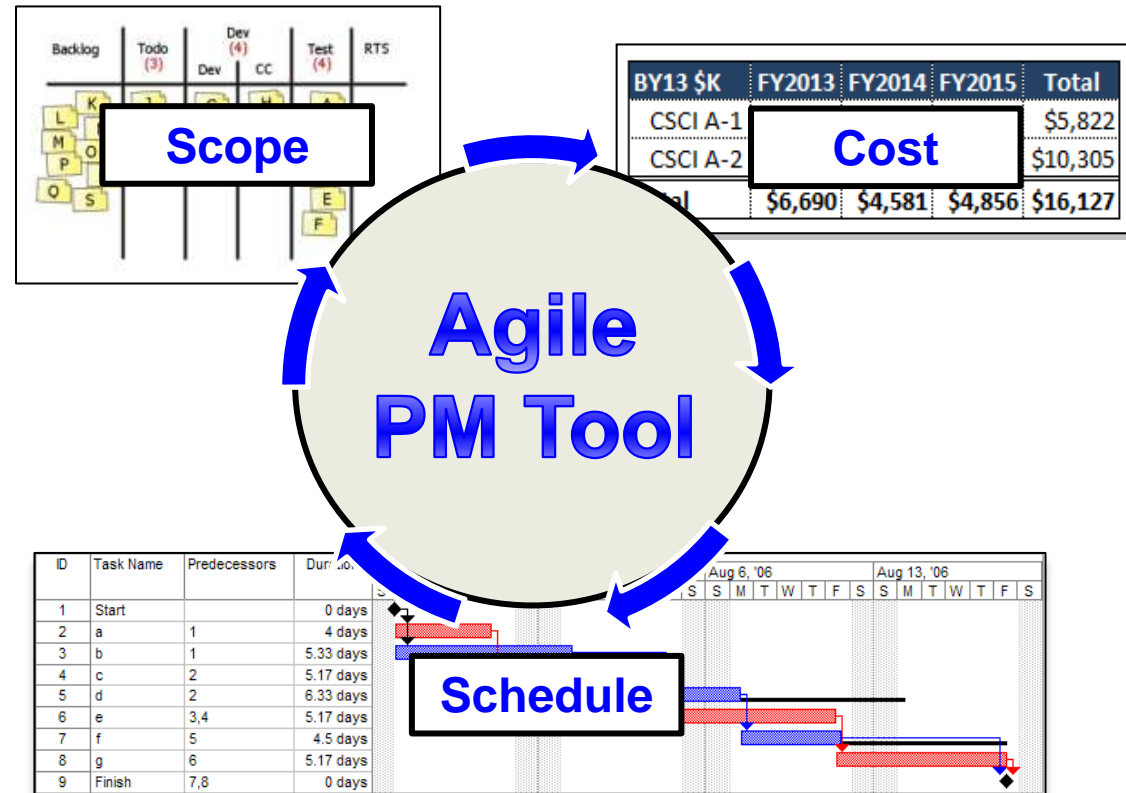
One client implementation of Agile PM Tool to-date: Success!

▸ Client relied heavily on the tool for in-progress scope re-prioritization

▸ Tool projections proved to be very accurate

In-Progress Brief (Project 50% Complete)	Final Status Brief (Project 95% Complete)	PM Tool Accuracy
Cost Analysis		
Agile PM Tool predicted costs would reach **full contract value**	Contractor was funded to and is on track to burn to **full contract value**	100%
Schedule Analysis		
Agile PM Tool predicted schedule slip of **two months**	Schedule extended **two months** to finish test/fix cycle	100%
Scope Tradeoff Analysis		
Agile PM Tool estimated **342 of ~6000 points (~6%)** would be **deferred** from current release	Estimated **658 of ~6700 points (~10%)** will be **deferred** from current release with one sprint to go	Accurate within ~5% of total point estimate
Requirement Burndown		
Agile PM Tool estimated all requirements would be completed by **19th Sprint**	All requirements were either **"closed"** or **"pending"** at the end of **19th Sprint**	100%

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For further information . . .

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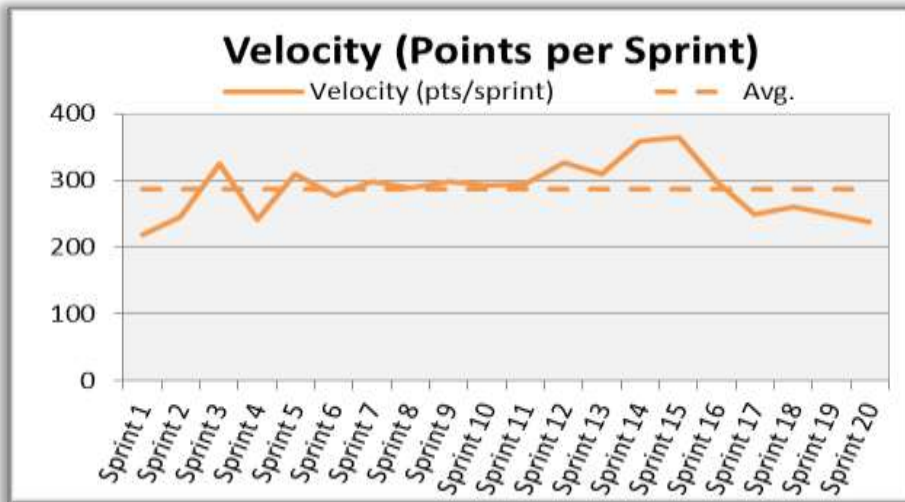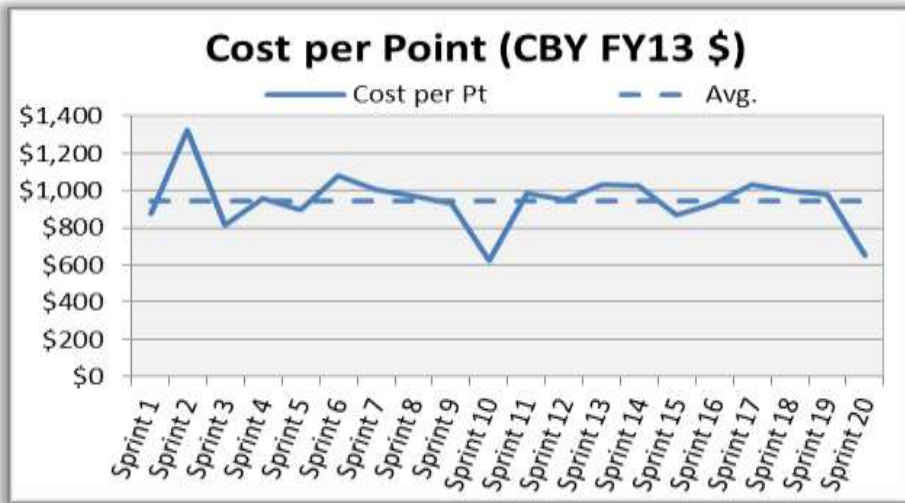mahmoud_omar@bah.com

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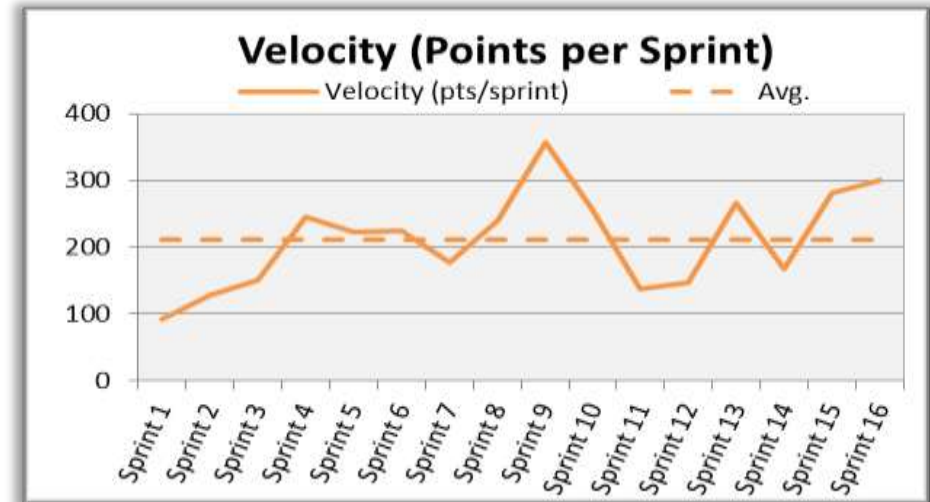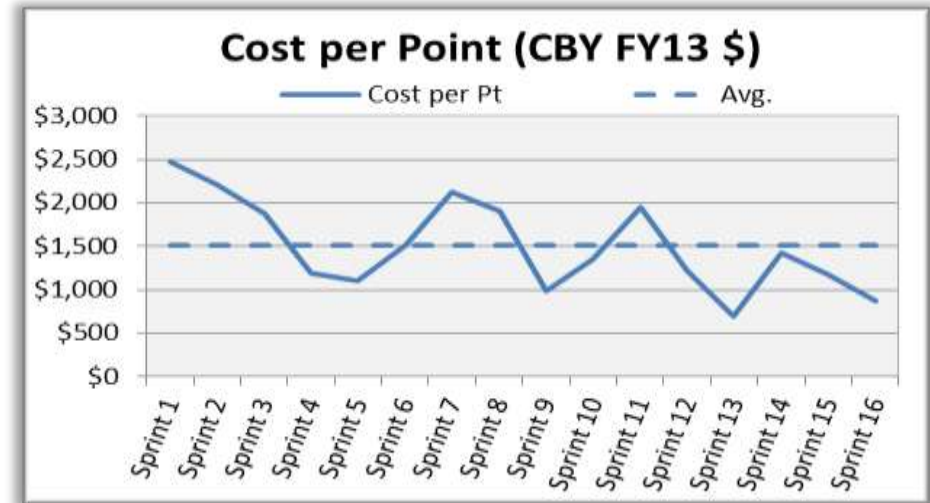Chicago, IL 60606
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Back-up Slides

Comparison of Agile SW Dev metrics from two unique projects

Project A Scope Breakdown
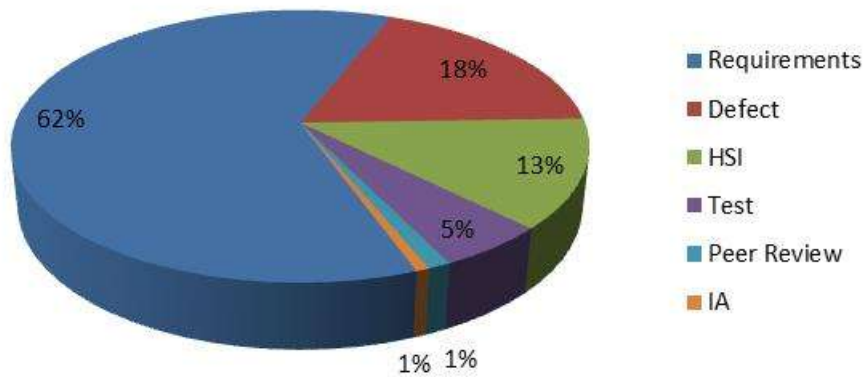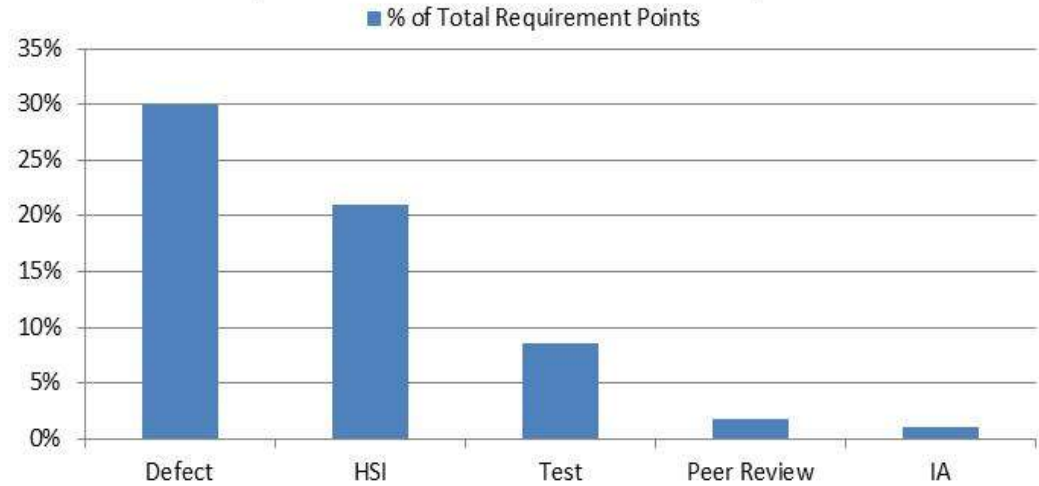
Traditional vs. Agile Process Overview

Traditional (Waterfall) Approach

Sequential activity of one team

– Plan all of the requirements

– Design all of the requirements

– Develop all of the requirements

– Test all of the requirements

Users will receive end product once ALL requirements have been fully designed, developed, and tested

Agile Approach

Iterative approach where constant user interaction is preferred and highest priority items are completed first

– Determine arch/funct rqts

– Take each Iteration:

  • Design it, Develop it, Test it, Deploy it

– Each requirement can be designed, developed, and tested simultaneously along with other requirements

Agile doesn't change the end product, only the way projects are scoped, managed and executed