

SCRUM @ NASA'S ENTERPRISE APPLICATIONS COMPETENCY CENTER (NEACC)

A CLOSER LOOK AT BENEFITS AND CHALLENGES OF
AGILE PROJECT MANAGEMENT

PMI Luncheon
April 21, 2009

Terry Langley  John Hopkins

Summary Bios

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Terry Langley 

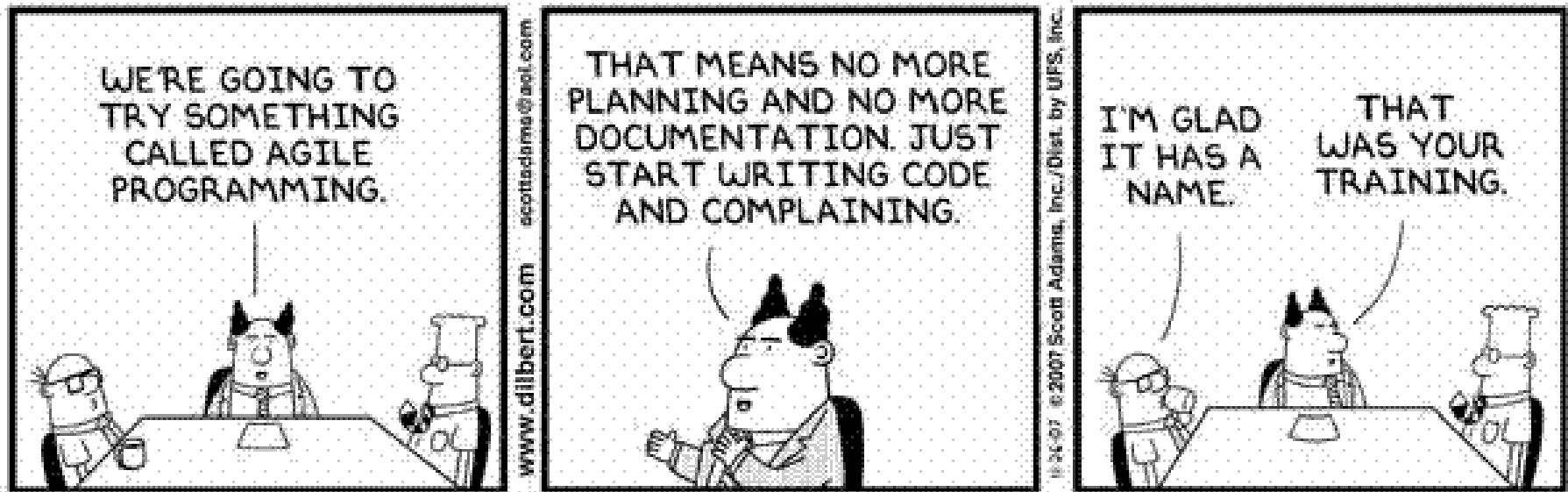
- NASA Lead for Software Assurance/Agile Process Support
- 20+ Years in Software Systems Engineering including ERP Software
- NASA PP&E Deputy Project Manager
- Focus on Project Delivery, Strategic Initiatives, and Business Case Development

John Hopkins



- 11 Years in Software Development, Software Project Management, ERP Solutions
- Played key role in NASA EACC transition to Scrum and organizational change effort to support transition
- NASA UNITeS PP&E Project Manager & Quality Assurance Delivery Manager
- Certified Scrum Master (CSM)
- Project Management Professional (PMP)

"Agile" Has Come A Long Way...



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Talking Points

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- NASA Enterprise Applications Competency Center (NEACC) Overview
- Why Did We Change?
- Why Scrum?
- How Does Scrum Work?
- How Did We Change?
 - Steps We Took from the Start
 - Organizational Obstacles We Encountered
- Key Benefits Realized
 - Results Summary
 - Employee Perspectives
 - Where are we today?
- Scrum's Compatibility with PMI & the PMBOK
 - PMBOK's Knowledge Areas & the Scrum Workflow
 - How Does PMI Feel?

NEACC Overview

- **Background:**
 - Located in Huntsville, AL
 - Provides Agency-wide Enterprise Applications Support, IT Infrastructure Support, and Applications Development Services for the NASA Agency
 - Provides functional and technical support to 11 Functional and Technical Lines of Business, spanning over 60 applications
 - Combination of NASA Civil Service and Contractors

- **Vision:** A modern, integrated business environment helping NASA achieve its strategic vision

- **Mission:** To improve financial, physical, and human capital management processes throughout the Agency – re-engineer NASA's business infrastructure using industry "best practices" and deploy enabling technology to provide management information needed to implement the Agency's Strategic Plan

- **Purpose:** To transform business systems and processes to improve NASA's fiscal and management accountability

Why Did We Change?

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- We weren't discovering the customer's 'real' requirements until it was too late
- We never had enough time to perform adequate testing
- The internal customers were not happy with the systems we delivered
- The work environment wasn't fun and creative
- We weren't moving towards our vision
- Something was "missing" – there had to be a better way

Why Scrum?

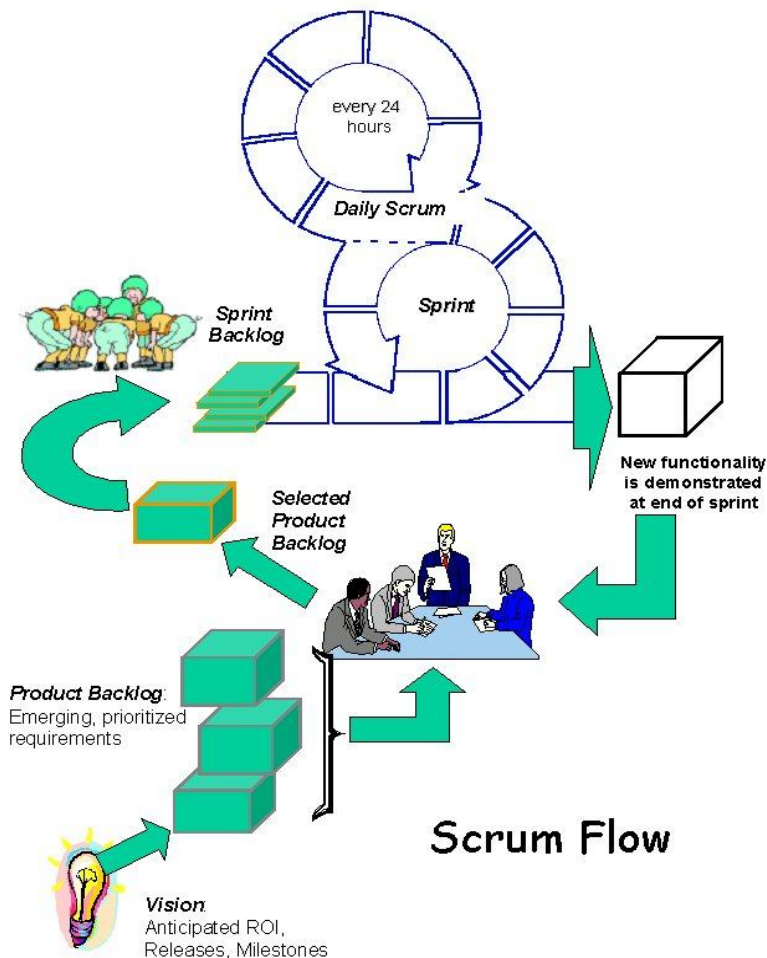
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- In 2006, vendor challenges coupled with inadequate testing of unclear requirements created an impetus for change
- Familiar with the concept of rapid/iterative development, the NASA Software Assurance Manager sought out a better approach
- Scrum surfaced as an alternative after several months of research. The Scrum process was intriguing and seemed attractive because of its core tenets:
 - Close interaction with the user
 - Co-location of cross functional teams
 - Shorter development iterations
 - Quicker turnaround time to produce working software
 - Higher quality of software delivered leads to less post-release defects
- The decision was made to pilot the Scrum process on a small project, and early results demonstrated positive results; however “ugly warts” surfaced which needed attention
- Within several months, Scrum became the de facto standard process for NEACC projects and remains the standard today

How Does Scrum Work?

Process Overview

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Key Practices

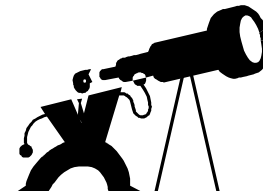
- Self-directed; self-organizing teams (preferably co-located)
- Iterative Adaptive planning
- Stakeholder/Customer Involvement
- 30-calendar day iterations
- 15 minute daily stand-up meeting
- Team measures progress daily
- Each iteration delivers tested, fully-functional software for demonstration
- Always 30-days from potential production release
- Sprint Retrospective Process
- Create a rhythm and flow

How Did We Change?

Steps We Took From the Start

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- It starts with a champion
 - ▣ A change agent is necessary for Scrum to succeed
- Got buy-in for use of Scrum from Competency Center Director
 - ▣ Change in culture is so drastic that you need to have commitment from top levels
- Worked with Building Manager to create Scrum rooms
 - ▣ Cubicles hinder open communication and teamwork
- Engaged a 'Scrum Coach'
 - ▣ Offered basic Scrum training
 - ▣ Provided training for Product Owners
 - ▣ Certified Scrum Masters
 - ▣ Took some of the bullets for us which helped teams gel
 - ▣ Coach continues to monitor teams periodically and suggest areas for improvement



How Did We Change?

Organizational Obstacles We Encountered

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- Difficulty in educating all teams on Scrum process and principles (change in traditional thinking)
- Dominant personalities & role of 'hero'
- Destructive behaviors (willingness to adopt Scrum/self direction)
- Resource pooling limitations
- Insufficient product backlog management (stay away from 'geek speak', utilize user stories' instead)
- Poor grasp of team velocity & over commitment tendency
- Managers can micro-manage & may lack trust - trust in employee judgment can be lacking in some cases



Key Benefits Realized

Results Summary

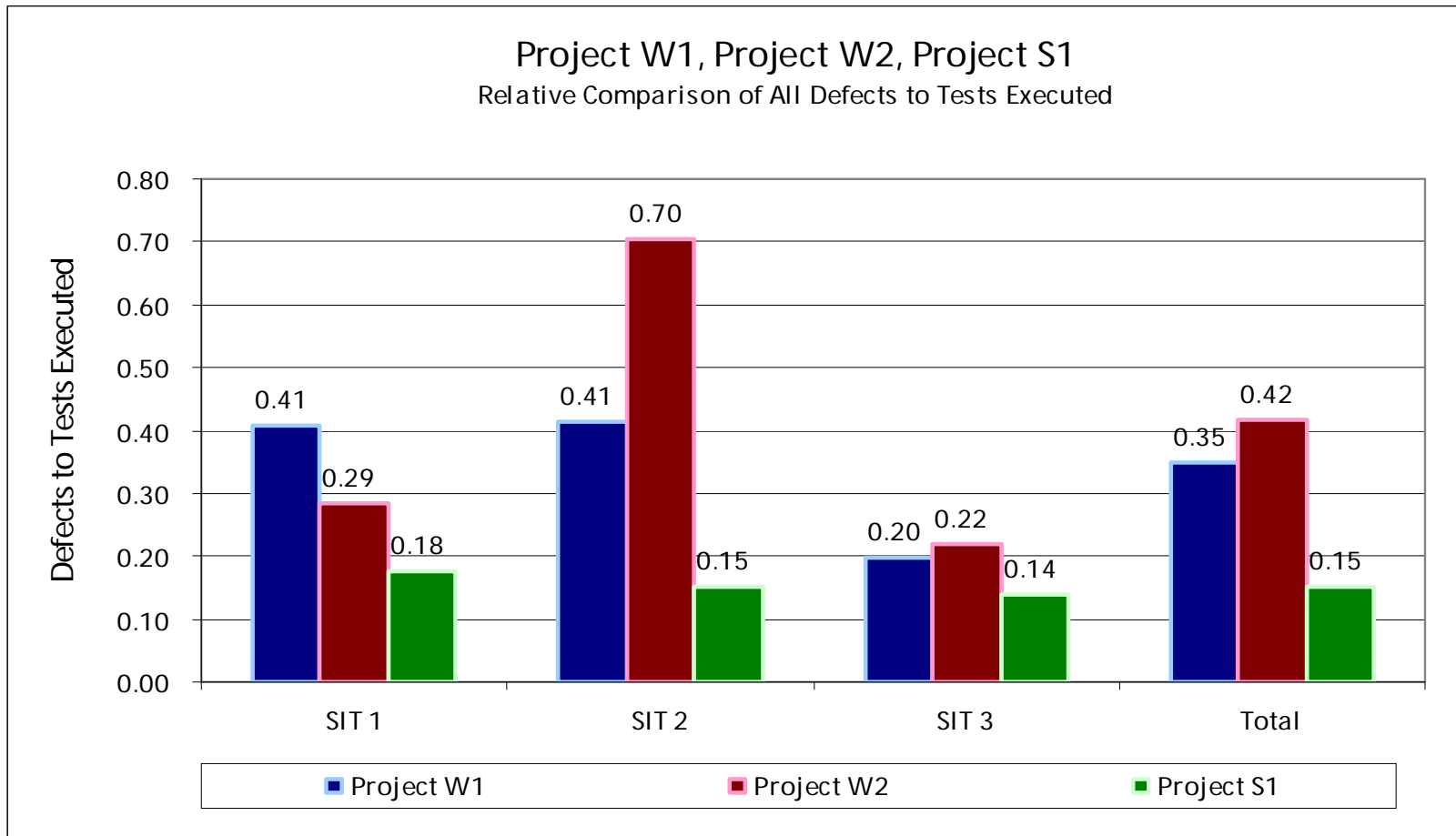
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- Greater accuracy and understanding of user needs through frequent interaction and regular checkpoints (Sprint reviews)
- Customers are excited about their new level of involvement
- Teams are better equipped to estimate cost & schedule
- Team members are more engaged and have a new level of commitment to their work & teammates
- Higher quality of delivered products and services – less defects prior to release; fewer bugs and change requests post-release
- Collected metrics which quantified the results

Key Benefits Realized

Results Summary – Scrum Works!

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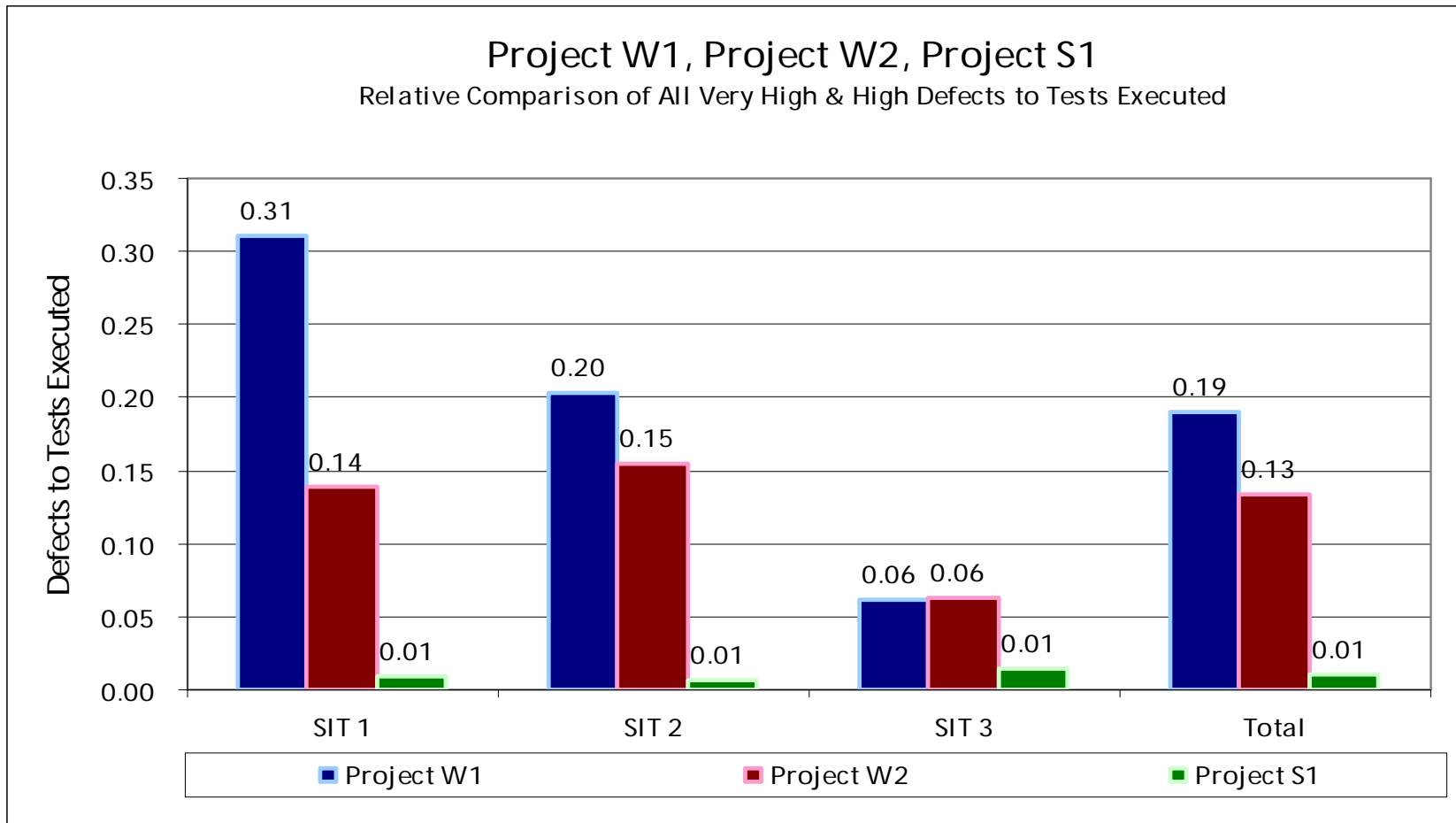


When looking at total defects logged, 2 traditional projects had total defect to test ratios of .35 & .42 respectively, whereas the Scrum project had a ratio of .15

Key Benefits Realized

Results Summary – Scrum Works!

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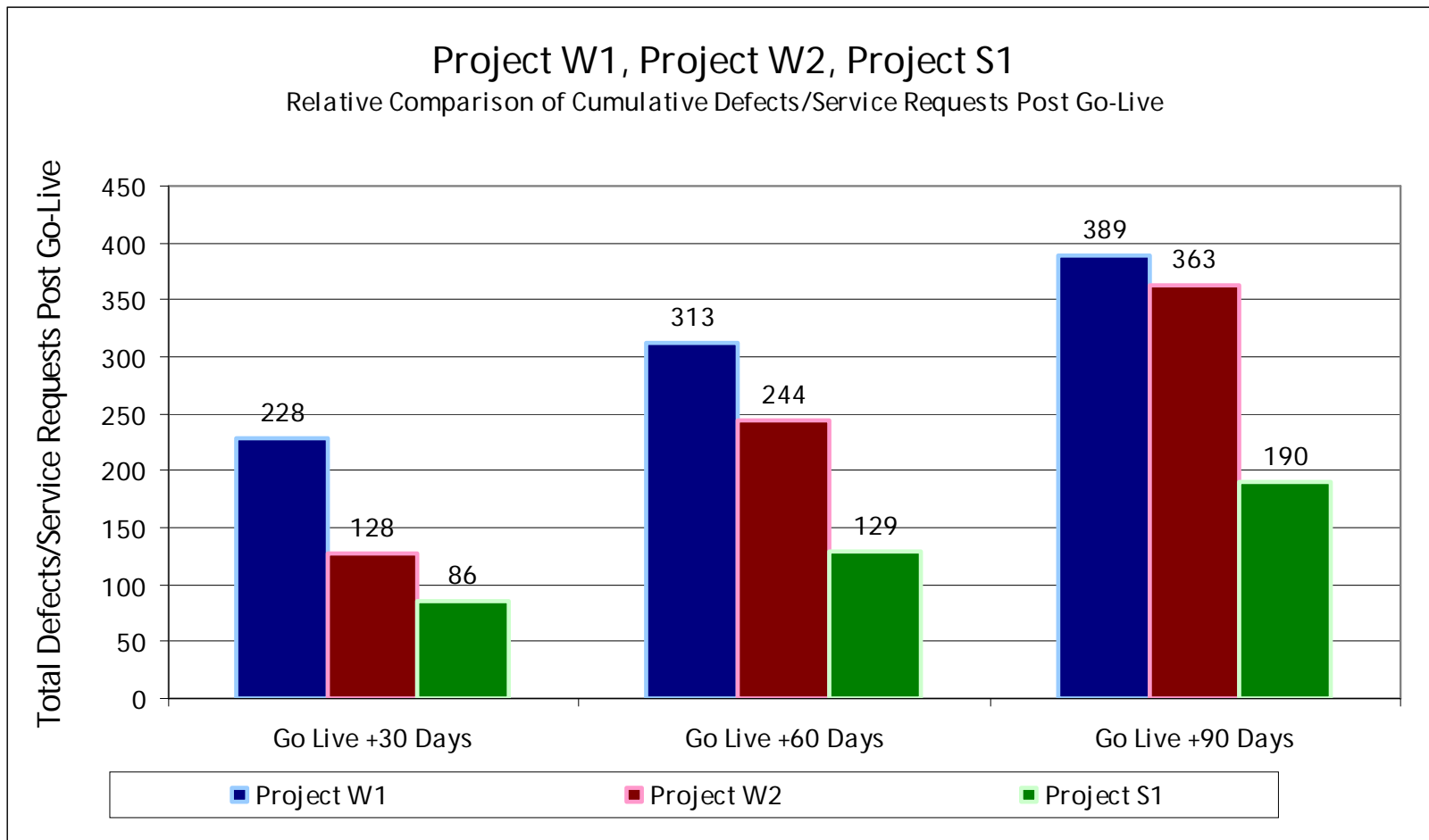


When comparing the total Very High & High defects, 2 traditional projects had ratios of .19 & .13 respectively, whereas the Scrum project had a ratio of .01!

Key Benefits Realized

Results Summary – Scrum Works!

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After Go-Live, Defect/Service Request ticket counts for Project W1 and W2 outpaced Project S1 by more than 2 to 1 and 1.9 to 1, respectively.

The “Unofficial” One Word Employee Survey....

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Uniting Thumbs-up Change Integration

Discipline **Innovative** Focused

Fast-Paced Awesome Accountability

Tough **Effective** Believer

Complex Communication

Scrumtruescent Organized Enlightening

Policies Team-Building

Challenging Flexibility So-So

Key Benefits Realized

Where are we today?

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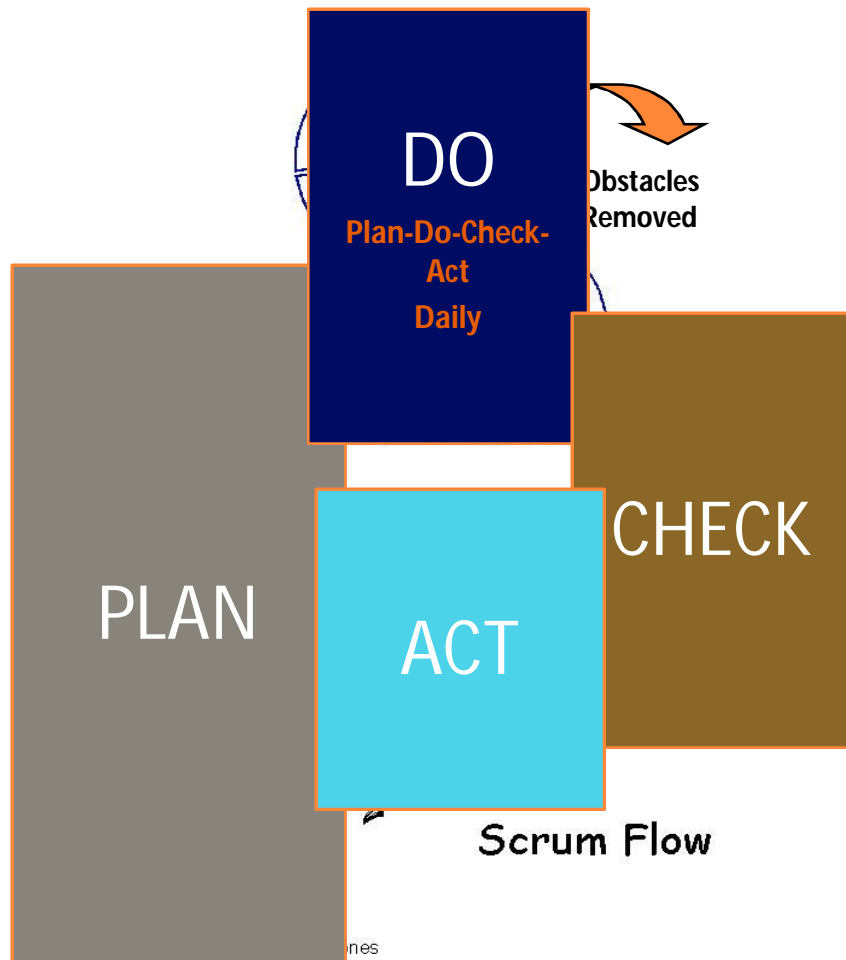
- Most major NEACC initiatives since Fall 2006 have utilized Scrum
- Scrum is gaining visibility throughout the Agency
- Utilization of Scrum has not been limited to software development efforts
- Scrum principles are being applied to strategic focus areas across the program
- Emphasis on cross-functional collaboration is key
- Time-boxed iterations help to frame what can be accomplished in a given time period

Scrum's Compatibility with PMI & the PMBOK

Can the two work together?

Is Scrum Compatible with PMI & the PMBOK?

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- Scrum projects should utilize the 9 Core PMI Knowledge Areas and 5 Project Phases
- Scrum workflow fits nicely with Deming's PDCA model
- Generates useful knowledge to continually improve
 - Process
 - Product
 - People

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How Does PMI Feel?

A Perspective from Gregory Balestrero (PMI CEO)

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- “There is no question that agile PM is a leading and emergent practice. It has great traction in software development and software installation. It is now moving into mainstream activities such as manufacturing in the telecommunications field.”
- “...on the Scrum side, there was the perception that ‘the PMI way is incompatible with agile.’ And there is also a misperception that PMI “methodology” pushes against the movement of speed and agility in PM. Both sides of the proverbial fence share misunderstandings that needed correction. ”
- “...the *PMBOK® Guide*, at least the 4th edition, is compatible with iterative planning, scalable WBS, etc. Yet, the misperceptions exists.”
- “The issue that gets in the way of an agile approach seems less the issue of the *PMBOK® Guide*, but more the issue of organizational culture. ”
- “Maybe, just maybe, there should be strategic principles and values that address management style, instead of viewing management, and in particular project management as a tactical approach for which someone else is responsible. ”

Contact Information

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- John Hopkins
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Reference Sources

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- **Agile Estimating and Planning – Mike Cohn**
- **User Stories Applied: For Agile Software Development – Mike Cohn**

- <http://www.scrumalliance.org/>





Questions & Open Discussion