PROCEEDINGS

AGILE IN DEFENSE
Summer Workshop
July 23, 2013

Some Assembly Required: Better Buying Power, IT Acquisition and Agile Methods

This workshop was presented and Facilitated by ADAPT – Agile Defense Adoption Proponents Team

ADAPT hosts regular meetings and workshops focused on adopting agile methods in Defense and Government acquisition. The team is composed of a cross-section of Government, Industry, and Academia interested in fostering better acquisition of software by Government.

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ACKNOWLEDGEMENTS

The Association for Enterprise Information wishes to acknowledge the following people for their contributions to this workshop:

Speakers:

David M. Wennergren, Assistant Deputy Chief Management Officer, Department of Defense

Brian Wernham, Consultant and Author of the Agile Project Management for Government

Steve Messenger, Chairman, DSDM Consortium, UK

Dr. Matthew Kennedy, Professor of Software Engineering at Defense Acquisition University

Stephen Denning, renowned author and management consultant

Planners and Facilitators from ADAPT:

Richard Cheng, lead of Excella Consulting's Agile Center of Excellence and ADAPT board member

Dr. Matt Kennedy, Professor of Software Engineering at Defense Acquisition University

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Scott Suhy, CEO, Greenline Systems, Inc.

Jon L. Gross, Software Engineering Institute

EXECUTIVE SUMMARY

Change is happening. Across government, agencies are seeking ways to streamline processes and lower IT costs. Agile is part of this trend because iterative processes in the dynamic world of information systems make more sense than established, traditional methods. The fact that the conventional waterfall acquisition process does not work well for information systems has been well documented.[1]

Agile is working. Right now across the Federal government we are seeing more and more evidence of agencies adopting agile methods to improve the delivery of information capability. However, the anecdotal evidence points to agencies such as DHS, the VA, and the FAA being ahead of DoD in institutionally implementing agile methods as a way to improve how they acquire enterprise information capabilities.

This workshop was oriented towards providing industry-government interaction on how Better Buying Power 2.0 (BBP) and IT Acquisition transformation is supported by Agile methods, and to examine in workshop format specific actions that can be recommended to improve use of Agile in DoD Acquisition. It was constructed as a follow-on to a paper ADAPT submitted to USD (AT&L) in which the BBP 2.0 Initiatives of Affordability and Cost Control, Acquisition and Contracting, Eliminate Unproductive Processes, Workforce Training/Certification, and Changing Culture were called out as areas agile methods can contribute.[2] These were the general topics of the five facilitated group sessions held during the workshop.[3]

Key Points

Taking an enterprise view
All of the sessions addressed the need for agile to be approached from an enterprise perspective. Affordability, controlling cost, acquisition and contracting, eliminating unproductive processes, training the workforce and changing the culture are enterprise-level issues. Achieving these BBP 2.0 objectives in the information domain through agile methods can only be effectively done within the context of the enterprise. Relegating Agile to scattered and uncoordinated programs and project teams will simply not deliver the level of the benefits available. The workshop acknowledged that the Department faces a challenge in addressing the gap between its requirements, governance and budget (JCIDS, POM/PPBE, etc) processes and the use of agile methods on programs/contracts.

Providing Training and Agile Coaching
Agile methods cannot be effectively implemented, managed and governed without training and coaching, and much more needs to be done. Integrating agile methods into Defense acquisition

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[1] The Defense Science Board Task Force Report, *Department of Defense Policies and Procedures for the Acquisition of Information Technology*, March 2009; Section 804 of the 2010 National Defense Authorization Act; and the AFEI Industry Task Force Report, 2010 NDAA, Section 804 - *Industry Perspectives on the Future of DoD IT Acquisition*, May 25, 2010 are a few of the examples where changing the IT acquisition process has been recommended.

[2] Achieving Better Buying Power 2.0 for Software Acquisition: Agile Methods, June 18, 2013, *Strengthening Acquisition – Doing More With Less*, http://www.afei.org/WorkingGroups/ADAPT.

[3] These are patterned after the World Café methodology (http://www.theworldcafe.com/method.html).

requires that all the functions that touch an acquisition must have a sufficient understanding of the agile process. This means that from senior executives down to programmers, each should have the appropriate level of training necessary to understand how the agile processes fit within the performance, governance and oversight of the program. Training should be targeted to the specific roles and responsibilities of each so that they acquire the skills necessary to accomplish their responsibilities effectively.

Coaching is the ongoing monitoring and advising of teams implementing agile methods to help them keep on track. While useful for all project teams (including those charged with oversight), it is particularly important for development teams that are new to the principles of agile and who are not well-practiced in how to actually accomplish agile processes. An example is helping teams avoid creating "bow waves" of requirements, and in doing so piling up unnecessary technical debt (work that needs to be done before a particular job can be considered complete). The postponement of important work is sometimes due to inexperienced teams and poor estimation and is often cited as a reason why agile projects fail. It is a valid concern for DoD acquisition authorities, but it is a problem that sufficient training and coaching can easily overcome.

Changing Culture

Mr. David Wennergren pointed out in his opening talk that changing the culture is perhaps the most difficult and important element (See his Top 10 Things). Café session participants agreed that the culture issue was most of the biggest impediment to adopting agile in the right way and making it successful. One reason is, as Mr. Wennergren said, is that in today's world the pace of technological change is so much more rapid that cultural change problems of the past are even more difficult. He also emphasized that "the skills that brought you to today will not necessarily be the skills that will take you into the future."

Some of the challenges pointed out in the sessions are keeping those charged with oversight comfortable with agile processes, and being able to prove the benefits of agile are real. Engaging all stakeholders, from Congress to accounting to testing to logistics, will help overcome the false sense of security that familiarity and experience in the conventional approaches creates. When agile projects fail there is always the call to go back to waterfall, but when waterfall projects fail (sometimes quite spectacularly) we just keep doing the same thing.

Conclusion

Agile methods applied in the context of enterprise-level processes are the best approach to helping assure efficient and effective use of agile. The results of this workshop also reinforce that training and coaching are essential to successful adoption of agile methods. Team training across functional areas and continued coaching as agile is implemented are necessary to reinforce change in mindset and how teams work that is vital for successful adoption of agile methods.

Agile methods offer DoD the opportunity to increase both efficiency of SW development and its effectiveness, as shown in the AFEI report, *The Business Case for Agile Methods*.[4] However, Agile is not a panacea. There is no "one size fits all" approach that is workable across DoD, as pointed out in Software Engineering Institute Technical Note, *Considerations for Using Agile in DoD* - "implementation of Agile must be tailored to fit the situation and context." [5]

The good news is that there is increasing evidence that Commands, Services and Agencies within DoD are using agile methods at the program/project level. However, there remains a gap between the use of agile on programs and projects and the upper-level processes that determine requirements, budgets, and governance. The revision to the DoD 5000 series that has been in the works for a long time now is said to address incremental development and that it "should support increased Agile development."

Some contend that agile is a part of the DoD acquisition "tool kit", and that it should be applied where it will provide benefit and where teams are structured, trained and experienced to implement agile successfully. Many would agree with the second part of that statement, and disagree with the first. Labeling agile as just being another acquisition tool carries with it the implication that agile is fundamentally compatible with the established acquisition process, like Earned Value Management. This misses the whole purpose of agile, which is to follow a different process (iterative vs. waterfall) which at its core conflicts with some of the established acquisition norms. Agile should be considered an alternative process for acquiring critical capabilities (information systems) which are dynamic, transformative and constantly evolving, and focus should be given how to effectively interface agile tools with the current acquisition process.

Issues for the Future
- Legacy is an issue: when to modernize, when to replace
- Testing (development and OT&E) – how to accomplish on a frequent to continuous basis
- Sustainment and support of capabilities introduced iteratively
- Dev Ops is becoming an important consideration as we look at frequent releases of capability into fielded systems
- The inversion of the "iron triangle" – holding cost and schedule fixed and allowing requirements to vary
- Development of the Agile Program Management Office capabilities and training

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[4] AFEI Report, *The Business Case for Agile Methods*, November 4, 2011.
[5] *Considerations for Using Agile in DoD Acquisition*, TECHNICAL NOTE CMU/SEI-2010-TN-002, April 2010

AGILE IN DEFENSE

Some Assembly Required: *Better Buying Power, IT Acquisition and Agile Methods*

1.   WORKSHOP PURPOSE

The Agile Defense Adoption Proponents Team (ADAPT) is composed of industry and government representatives who are interested in advancing the adoption of agile software development methods, acquisition and management principles in DoD acquisitions.

ADAPT facilitates industry-government interaction in policy, legislative, legal and technical areas directly related to understanding, assessing and implementing agile methods in programs, projects and procurements. Such interaction is intended to promote understanding of agile methods, when they are appropriate for use, and how they may be implemented within the context of Defense acquisition.[6]

Following the November 2012 Agile in Defense workshop ADAPT took on the crafting of a paper on how agile methods supported some of the objectives of the Better Buying Power 2.0 initiative championed by Mr. Frank Kendall, USD (AT&L).[7] In February 2013 ADAPT facilitated a workshop to provide industry-government interaction in policy, contracting/acquisition and technical areas directly related to understanding, assessing and implementing agile methods in DoD programs, projects and procurements. The purpose of the workshop was to solicit community input on how Agile methods can influence DoD Better Buying Power 2.0, and to identify the appropriate DoD Better Buying Power 2.0 focus areas where agile methods could make the most impact. This data would then form the foundation for developing the paper on contributions of Agile Methods to the DoD Better Buying Power 2.0 initiatives that was submitted to Mr. Kendall. The report on the workshop results can be found on the AFEI web site.[8]

This workshop was oriented towards providing industry-government interaction on how Better Buying Power and IT Acquisition transformation is supported by Agile methods, and to examine in workshop format specific actions that can be recommended to improve use of agile in DoD Acquisition.

The agenda was composed of several presentations by leaders from the Federal Government, industry and academia. It featured a series of Café Sessions led by facilitators from ADAPT. These sessions focused on the following topics:

- Affordability and Cost Control
- Acquisition and Contracting
- Eliminate Unproductive Processes
- Workforce Training/Certification
- Concurrency, Program Management and Governance
- Changing Culture

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[6] Reference ADAPT pages of AFEI web site, http://www.afei.org/WorkingGroups/ADAPT

[7] Achieving Better Buying Power 2.0 for Software Acquisition: Agile Methods, June 18, 2013, *Strengthening Acquisition – Doing More With Less*, http://www.afei.org/WorkingGroups/ADAPT

[8] Report: Agile Methods and Better Buying Power 2.0, Open Meeting Discussions, February 15, 2013, http://www.afei.org/WorkingGroups/ADAPT

2.   SPEAKERS

Presented here is a synopsis of each speaker's remarks followed by their bio.

David M. Wennergren
Assistant Deputy Chief Management Officer, Department of Defense

Mr. Wennergren spoke on the top ten principles he sees as essential to the innovation and evolution of Defense Department information environments. He pointed out that the workforce must be IT savvy and that modular, incremental, collaborative and customer involvement must be attributes of the organization.

Dave Wennergren's Agile In Defense Top Ten List
Number 10 – Confront and Embrace Reality

We often get trapped in protecting the things we have worked hard to make happen and that are successful. In IT that translates into holding on to legacy systems way past their time, which is costly in terms of money and manpower. He likened it to the system you have versus the system you need. Technology continues to change at a pace and in ways that are difficult, if not possible to predict. We are in tough financial times, particularly in DoD, and he referenced Ernest Rutherford, known as the "father" of nuclear physics; who is quoted as having said "We had no money, so we had to think".[9]

Dave indicated that the future of information in Government is mobile, cloud and self-service. "It's been fascinating to watch how technology has changed. People can do self‑service, and a young naval lieutenant can go home tonight and go mash up some new application and post it someplace where it can actually be used tomorrow. The days of an IT solution taking months and months, and a bunch of programmers walled up away someplace, are behind us."

Number 9 – It's All About the Data

He spoke about the need to develop trust in others data and use shared services. Basing decisions on data eliminates making decisions out of fear and ignorance.

Number 8 – Take an Enterprise View

He encouraged leveraging the buying power of the large DoD enterprise through enterprise licensing of software, and continuing to embrace Enterprise Architecture across the Department, to include growth of shared services.

Number 7 – Fix the Process First

Avoid constantly changing systems to fit broken processes. Fix the process and then develop systems around it.

Number 6 – The Status Quo No Longer Applies

He said that 75% of the approximately $7 billion DoD spends on information technology is to maintain legacy systems. He encourages leveraging new technology and making verticals and horizontals work together.

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[9] Rutherford pioneered the orbital theory of the atom in his discovery of Rutherford scattering off the nucleus with the gold foil experiment, Wikipedia entry, http://en.wikipedia.org/wiki/Ernest_Rutherford

Number 5 – Foster Innovation

Here he spoke about the Innovator's Dilemma[10] by Clayton Christiansen. First published in 1997, Christensen suggests that successful companies can put too much emphasis on customers' current needs (essentially doing everything right), and fail to anticipate change and or to adopt new technology or business models that will meet customers' unstated or future needs. Wennergren advocated the use of pilot projects and experimentation as ways of discovering the future needs of users.

Number 4 – Secure Information Sharing

A common theme of Dave's over the years, it is an expression of the need to both share and protect information. He referenced the book *Polarity Management*[11] by Barry Johnson to underscore the idea that there will always be tension in DoD IT between enterprise versus local requirements, information sharing versus information assurance, and known users versus unanticipated users.

Number 3 – Create the Right Culture

Dave advocates creating a culture that asks the right questions. He referenced the book by Simon Sinek, *Start with Why: How Great Leaders Inspire Everyone to Take Action*[12] that presents the central question of every organization should be why? The answer establishes the purpose or belief underlying everything the organization does.

Number 2 – The Power of Alignment

Dave has always been a fan of George Labovitz and his book, T*he Power of Alignment*[13]. He spoke about the ongoing need for leaders to keep their people centered in the midst of change, de-emphasize hierarchy, and distribute leadership by distributing authority, information, knowledge, and customer data throughout their organization. Leaders must link the five key elements of an organization—people, process, customers, business strategies, and leadership to achieve and sustain high levels of performance.

Number 1 – Leading Change

This is the key to making fundamental changes in how business is conducted in order to help cope with a new, more challenging environment. Dave referenced the classic book by John P. Kotter, *Leading Change*[14], and talked about creating a sense of urgency. Making change happen loops back to the number 10 on the list, Embracing Reality and relates directly to number 5, Foster Innovation. He reinforced that creating a sense of urgency in the organization is equally critical. Speed, agility, and proactivity are necessary requirements for survival and success — yet they cannot be pursued at the expense of disciplined execution and consistent quality.[15] But to accomplish the top ten list requires building trust in others, and Dave referenced the book by Stephen M.R. Covey, *The Speed of Trust*[16], to emphasize the important role of trust in leading change.

[10] The Innovator's Dilemma, Clayton Christensen, HarperBusiness; Reprint edition (October 4, 2011)

[11] Polarity Management: Identifying and Managing Unsolvable Problems, Barry Johnson, HRD Press (January 1, 1996)

[12] Start With Why: How Great Leaders Inspire Everyone to Take Action, Simon Sinek, Portfolio Trade; Reprint (December 27, 2011)

[13] The Power of Alignment, George Labovitz and Victor Rosansky, Wiley; 1st edition (June 2, 1997)

[14] Leading Change, John P. Kotter, Harvard Business Review Press, Revised Edition, 2013

[15] Awesomely Simple, John Spence, Jossey Bass, September 2009, http://awesomelysimple.com/

[16] The Speed of Trust, Stephen M.R. Covey, Free Press; Reprint edition (February 5, 2008)

He made the point that individuals get to comfortable and need to take some risk, and that people naturally are adverse to change. "If you think about it, why wouldn't you be because how did you become the successful professional that you are? Part of it was your keen intellect and charming wit and all that kind of stuff. But a lot of it is you become very adept at how the organizational processes work. When something radically changes that's going to perhaps make your expertise less relevant going forward, it's only natural that you might be reluctant to change.

The need to take that risk — the need to be able to step out of your comfort zone and take that step into the new — is just ever more important. Trying to help people cope with how you can create structures where you can maintain a sense of urgency, build trust, overcome some of the risk aversion that you have, be able to use data so that you're making decisions based on truth rather than on fear and anecdote — those kinds of things, I think, are more crucial today than ever before."

Biography

Mr. David M. Wennergren has over 30 years of leadership experience in information technology and change management across the Department of Defense and federal government. Currently he serves as the Department of Defense Assistant Deputy Chief Management Officer, where he is the principal deputy to the DoD Deputy Chief Management Officer and champions the Department's efforts to better synchronize, integrate and optimize DoD business operations to improve effectiveness and increase efficiency. He previously served as Deputy Assistant Secretary of Defense for Information Management, Integration and Technology/Deputy Chief Information Officer, where he led the information technology and information management efforts for the Department of Defense. In addition to these duties, Mr. Wennergren served for five years as Vice Chair of the U.S. Government's Federal CIO Council, and has also served as Chair of the Committee for National Security Systems and Chair of the Department of Defense Identity Protection and Management Senior Coordinating Group, where he championed the successful deployment of the DoD Common Access Card. He has also served as the Director of the DoD Business Transformation Agency and the Director of the DoD-Veterans Affairs Interagency Program Office, championing the delivery of improved health information technology for service members, their families and veterans.

Brian Wernham
Consultant and Author of the Agile Project Management for Government

Mr. Wernham presented a case study, *The UK Ministry of Defence Gets Agile*, on the use of the DSDM methodology for a Ministry of Defence Program in the United Kingdom. The case study addressed how project teams and senior management governance we established and operated, how requirements were established and allocated, and how agile was applied to hardware as well as innovative software.

The system being developed was a Combat Identification System aimed to prevent friendly fire incidents that had been experienced in Afghanistan. The Mod decided upon an Agile approach which featured a fixed timescale/budget, flexible scope, incremental deliveries, and interdisciplinary teams within a DSDM project framework with formal requirements management, formal roles and project governance, and a controlled architecture. The DSDM methodology was selected for the following reasons:
- The was a need for an end to end process that was agile but also provided a good approach to planning, communication and control. A scrum of scrums is good for communication, but not for control

- "Scaling up" is a bottom up process, but the military must have top down organization and governance
- Initial determination of requirements was mandatory - - the DSDM approach of just enough design up front to give high level requirements gave the foundation for the iterative and incremental timeboxes that followed. Scrum starts with the backlog, but where does the backlog come from?
- This was a complex project that required more than just attention to the development sprints. Scrum can be used on a project, but a complex project cannot be run using Scrum.

Training in agile was given to the team and several governance challenges were identified as follows:
- When you encounter 'choppy waters' will you 'finger point' or collaborate?
- Establish Collaboration & Control NOT Command and control

The team found that requirements' trading was crucial to achieving the fixed timeline and budget goal. The MoSCoW technique was used in requirements analysis and software development to reach a common understanding with project stakeholders on the importance they place on the delivery of each requirement. MoSCoW establishes the prioritized feature set of 'must haves', 'should haves', 'could haves' and 'won't haves' that is the baseline for trading-off the requirements baseline to assure making cost and schedule performance.

Testing and Operational Success
During the evolutionary development testing was conducted at Tech Readiness Level 6 in the UK Battlespace Laboratory as follows:
- End of each 3–6 months spiral
- Final test 50+ battlefield positions
- Immoveable deadlines ensured use of Battlefield Laboratory on expected dates

A Tech Readiness Level 7 assessment was also conducted in an unscheduled trial in Norway August 2010 where interoperability of UK and US CIDS systems was demonstrated. In this trial Danish aircraft arrived without prep and immediately able to use "Link 16" connectivity on the ground and in the air with a 3 second response time and 5 meter accuracy.

The Tech Readiness Level 8 evaluation was conducted inside the "Bold Quest" 2011 exercise and featured full coalition interoperability testing

Lessons Learned
Mr. Wernham said that the lessons learned from the project are summarized as follows:
- Establish Clear Priorities from the Outset of the acquisition
- Allow priorities to evolve and change as the project progresses
- Iterate delivery
- Timebox work
- Delegate responsibility
- Have clear, unambiguous roles and accountability
- Trade requirements
- Ruthlessly sacrifice scope

Biography
Brian Wernham has more than 30 years' experience in adaptive change program leadership. He is an independent consultant and works in both the public sector and the private sector. He has extensive international experience in the USA, UK, Canada, Hong Kong, Germany and offshore development in Bangalore.

Steve Messenger
Chairman, DSDM Consortium, UK

Steve Messenger's talk was entitled *End-to-End Agile* and was an explanation of the DSDM methodology. The DSDM Consortium was formed 1995 as a not for profit entity in the UK. The organization is a Agile Manifesto signatory, and has members worldwide. The DSDM Consortium is an Institute For Government contributor, holds ISEB and UCAS accreditations, and is an active partner with APMG on AgilePM.

Extracted from his article on the subject,[17] Steve drew an analogy between agile and a sports car. Both are fast and efficient, get you there quickly, are sleek and shiny, and are dangerous in the hands of inexperienced/incautious operators. With both you need to know where you are going and a support infrastructure, and both can get you in trouble if in-expertly applied.

He described how DSDM establishes governance without bureaucracy through an agile project framework and an agile program management organization. The agile program management functions are
- Defining the vision
- Steering towards to vision
- Defining waypoints
- Stakeholder management
- Demonstrating control
- Let the team get on with it
- Establishing repeatable, auditable processes

Within this organizational construct the functions of the Agile Framework are to:
- Creating and maintaining the prioritized backlog
- Estimating and determining worth
- Conducting priority-based planning
- Analyzing architecture and infrastructure
- Deployment
- Implementing repeatable, auditable processes

The questions routinely asked about DSDM by those educated and expert in the waterfall-based project management approaches are:
- How do we cope with less precise business cases?
- How do we prioritize projects against each other (portfolio management) if you can't tell in advance what the benefits are?

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[17] *The Agile Sports Car*, DSDM Consortium, http://dsdm.org/dig-deeper/news/agile-sports-car

- How can this work in our regulated industry?
- How do we recognize and report that an Agile project is going wrong?
- How do we align seemingly ad hoc Agile project reporting with our time-based governance? (and reporting)
- How could we make the life of Agile project easier and quicker while also serving the needs of the organization?

These questions and more are answered within the method and accompanying pocketbooks that were distributed at the workshop and that are available through AFEI.[18]

Biography

Steve Messenger is Chairman of the DSDM Consortium and a leader in agile development. Steve has been involved in Agile since its inception, DSDM being one of the signatories of the Agile Manifesto, and was also pioneering iterative approaches to software development from the mid 1990s. As well as managing many Agile projects, Steve has implemented DSDM into the highly regulated pharmaceutical industry. Steve is a Certified DSDM Practitioner, Trainer and Examiner and has co-authored papers on DSDM and PRINCE2, applying DSDM in an offshore environment and using DSDM with PMBOK.

Dr. Matthew Kennedy, Professor of Software Engineering at the Defense Acquisition University

Matt Kennedy's talk was entitled *Scaling Agile - Agile Systems Engineering*. He began with a description of the three aspects of organizational agility: Business, Project/System, and Development. The Business aspect is responsible for the overall acquisition: contracting, funding, operational requirements, and system delivery structure, while the Project/System aspect conducts overall technical management. And further decomposes the requirements, allocating them to software or hardware. The Development aspect is, of course, the development of capabilities against the decomposed requirements. His key point here is that each of these contributes to achieving the same goal, and that a project is held captive by, and can only progress as fast as, its slowest aspect.

Development aspect frameworks are well known agile methodologies, such as Scrum. His presentation focused on scaling in the Project/System aspect. He described an approach to agile phases that have predefined input/exit criteria that fosters system engineering and agile practices simultaneously. Each phase features a planned release that has multiple embedded increments, integrations and sprints, and ends with ends with a retrospective prior to beginning the next phase. Sprints within each increment of a phase have input criteria consisting of a sprint backlog (work to be performed), specifications and interfaces, identification of user(s), definitions of "done", and exit criteria consisting of completed/user-accepted product(s) and proof the development item meets the definition of "done". In this concept a sprint could consist of agile software development (Scrum, XP, etc.), manufacturing processes, or a waterfall development process.

Dr. Kennedy discussed a case study in which the metrics used for comparison of traditional and scaled agile approaches were the estimated versus actual time to completion, functionality delivered, and cost. Describing the results of the project (which included hardware, firmware, mechanical design and integration), he showed that there was an overall improvement in each metric category. He concluded

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[18] DSDM Agile Project Framework, DSDM Limited, 2012 and The Agile PMO, DSDM Limited, 2012.

by saying that agility is contextual, that there is no standard approach and that each project must find its way to agility through solving its particular problem, while also learning from the success of others.

Biography
Dr. Matthew R. Kennedy is a Professor of Software Engineering at Defense Acquisition University (DAU). Formerly he was the Associate Director of Engineering at the National Cancer Institute's Center for Biomedical Informatics and Information Technology (CBIIT). He served in the U.S. Air Force as a network intelligence analyst and has more than 13 years of experience in Information Technology. He has a bachelor's and master's degree in Computer Science and a PhD. in Computer Science and Software Engineering.

Stephen Denning, renowned author and management consultant

Steve spoke about the growing revolution in management that id driven by the recognition that the traditionally accepted management approaches simply do not work in today's world. He asked the question, why did management systematically kill all the creative things in organizations?
- knowledge management?
- lean manufacturing?
- innovation?
- marketing?
- leadership storytelling?
- even Agile and Scrum?

He went on to say the prevailing thinking in management (textbooks, business schools, consultants, etc.) was based on prevailing and interlocking principles. Denning's five planks of traditional management are:
1. the purpose of a firm is to produce outputs that make money,
2. managers act as controllers of individuals,
3. work is coordinated by hierarchy and bureaucracy,
4. The main thing is efficiency
5. Communicate by directives

He cited as proof of the increasing failure of traditional management a report from the Deloitte Center for the Edge Shift Index indicating that the average rate of return on assets declined from 6.2% in 1965 to 1.3% in 2011, and the average rate of return on invested capital declined from 4.2% to 1.2% in those same years. He concluded that management is broken and went on to examine what he believes are the root causes.

Root cause #1 – The marketplace has changed
- Big firms used to own the marketplace
- Global competition and instant information to customers changed the balance of power.
- The customer is now the boss.
- Many CEOs haven't yet grasped this
Root cause #2 – Management is failing on its own terms
- Financial performance, ROI, etc.
Root cause #3 – Partial fixes don't work.

- Attacking individual components of the system does not change the interlocked, systemic problems.
- Just introducing storytelling won't stick
- Introducing Agile teams won't stick
- Partial improvements make no impact

Denning set out the principles and practices needed to accomplish that through five major shifts: (1) a shift in the firm's goal from producing outputs to delighting the customer; (2) a shift in the role of the manager from a controller to an enabler of self-organizing teams; (3) a shift in the way work is coordinated from bureaucracy to dynamic linking, (4) a shift from value to values; and (5) a shift from top-down commands to conversation. He predicts that this new paradigm he calls Radical Management will be well-recognized in 2014 and will have begun to be taken in and implemented by major corporations by 2020.

Biography
Steve Denning, Management Consultant, author of The Leader's Guide to Radical Management: Re-inventing the Workplace for the 21st Century. Steve is the author of the award-winning books, The Leader's Guide to Radical Management: Re-inventing the Workplace for the 21st Century (Jossey-Bass, 2010), The Secret Language of Leadership (Jossey-Bass, 2007) and The Leader's Guide to Storytelling (Jossey-Bass, 2005). He writes on radical management, leadership, innovation & narrative for Forbes.com.

Denning worked for several decades at the World Bank in many capacities and held various management positions, including Director of the Southern Africa Department from 1990 to 1994, Director of the Africa Region from 1994 to 1996, and Program Director for Knowledge Management from 1996 to 2000. After leaving the World Bank in 2000 he published five books on leadership storytelling and established himself as a global leader in the field. In 2001 he initiated the annual Organizational Storytelling Weekend in Washington D.C. under the auspices of the Smithsonian Institution.

In November 2000, Steve Denning was selected as one of the world's ten Most Admired Knowledge Leaders (Teleos). Steve studied law and psychology at the University of Sydney has a postgraduate degree in law at Oxford University.

3.   CAFE SESSIONS

The purpose of the café sessions was to give the participants the opportunity to discuss five different topics relating to the adoption of agile methods. Each session was facilitated by two members of ADAPT and was repeated five times so that everyone had an opportunity to discuss each area.

The following is a description of each topic area and the results that came out of the workshop

3.1   Cafe Session 1 – AFFORDABILITY AND COST CONTROL

Facilitators: Robin Yeman, *Lockheed Martin*
Steve Baynes, *Northrop Grumman*

Purpose

This session focuses on how agile methods and iterative development can help the Department make its software more affordable. The use of agile processes can help control costs by building software to the right requirements and by eliminating unnecessary reporting and documentation

3.1.1   Description

Abstract

Agile supports affordability initiative through providing:

- Better requirements management in SW development, iterative management of requirements towards user operational goals.
- Early enablement of cost/performance trades
- Mitigating risk through iterative nature of the agile process

Agile involves the customer regularly. In the case of DoD the customer should include all development constituencies (warfighter, acquisition agency, test community, etc). This works to assure that requirements are clear, complete, realistic, updated and accurate throughout. Agile projects support effective cost trades because value can be determined early, and prioritization can be more easily done across a portfolio. One value of consistent user involvement is higher assurance that customer needs are met and that the SW is fit-for-purpose.

Agile Methods contribute to controlling costs through:

- better definition of what is necessary
- re-evaluation of requirements based on results
- reduction in program control "overhead"

Controlling SW development costs at the beginning means using agile methods and user involvement in cycles to identify and adjust requirements as development progresses. Problems are discovered early and fixed, not at the end when it is more expensive to fix. Using Agile gives early warning of problems before excessive resources are committed.

3.1.2   Introductory Questions and Participant Responses:

1. What aspects have you seen increased affordability on your programs? (Example: Project Management, Test, Development)

- Estimation Techniques/ROI
- Wire framing to gather requirements(?)
- Prototyping/Spikes for risk reduction and increased information

- Time boxing forces prioritization/goals/increased productivity/fixed cost/flexible scope
- Engineering practices/Business Practices
- Think Enterprise level
- Flexibility PMO and across all program functions

2. What Challenges have you seen with Agile in regards to Affordability?
- Culture (reporting requirements, false sense of security in Waterfall/Pre-set budgets)
- Training (Government / Contractor)
- Focused on short term as opposed to long term benefits
- Creating bow-waves, focus on the commitments (work to be completed)
- Metrics (how do I prove)
- Technical debt management
- Trying to do both Waterfall and Agile on one project
- Parallelization
- Distributed teams

3. What practices have you seen with the biggest impact? (Example: Automation, ATDD)
- Incremental Delivery
- Technologies (Cloud/virtualization)
- Timeboxing
- One team - wear multiple hats
- Decreased budgets force innovation
- Training
- Engineering Practices
- Begin with end in mind, how much to maintain
- Value Stream Analysis
- Tools (Agile Project Management tool)
- User Involvement

4. What opportunities for affordability do you believe we should investigate?
- Organizational Structures
- Agile Budgets
- Contracting Structure (change management)
- Decentralize control for decision making
- Team based education (whole team)

5 Could you provide examples of Lessons Learned?
- Agile Coaching is Needed
- Need a clear Business Value / Customer satisfaction focus
- Reduce non value-add activities
- Implementing programs need top-down organizational training
- Teams need estimation practice (User Stories)
- Develop a Capability/Feature-based WBS instead of functional
- Remember Non-functional requirements

3.2   Cafe Session 2 - ACQUISITION AND CONTRACTING

Facilitators: Scott Suhy, *GreenLine Systems, Inc.*;
Jon Gross, *Software Engineering Institute*

Purpose

In this facilitated discussion, we will discuss these issues, exploring innovative ways to reconcile acquisition processes and agile methods and the obstacles that programs have experienced, and the successes that have been achieved, in overcoming obstacles. We will discuss how contracts can be achieved that protect the taxpayer, improve quality, and support the developers, all while providing faster value to the government and the public. Coming out of these discussions, attendees will have an understanding of the contracting and acquisition issues facing Agile programs and ideas on how to deal with these issues.

3.2.1   Description

Abstract

Some of the greatest challenges to adopting agile in the Federal government are contracting and acquisition processes. Federal acquisition often involves long procurement cycles, contracts based on sequenced work, well-defined deliverables, and splitting of program efforts across multiple contracts and vendors. All of this presents real challenges to effectively adopting agile and lean practices.

Introductory Questions:

1. What is best method to contract for Agile? (i.e. When is it appropriate to use Multi-Award IDIQ/BPA, Single-Award IDIQ/BPA with options or Successive contracts?)

2. What is the best payment strategy? (i.e. When is it more appropriate to use a fixed-price contract or a cost reimbursement / time & materials contract?)

Suggested Reading: (links for these documents are located at
http://www.afei.org/woringgroups/ADAPT)

- Considerations for Using Agile in DoD Acquisition
- The Case for Rebooting Federal IT Procurement
- Cindy Shelton, DHS, presentation from May 29 ADAPT Open Meeting - Acquisition, Contracting and Agile
- OMB Contracting Guidance to Support Modular Development

3.2.2   Summary and Discussion Results

The consensus arrived at through the five sessions was that it's more than contacting strategy or payment strategy.
- Examine good scope examples such as the VA T4 contracts and DHS Citizens and Immigration TICS / FADS contracts that are asking for agile
- A Product Owner responsibility should be identified in the contract and a contingency plan defined if the product owner is not available
- The Government may act as the systems integrator, creating a challenge.   Responsibilities must be defined on what is expected from the government acting in this role. Are they the scrum masters? Are they the Product Owners? Do they own processes such as continuous integration.
- The project executive (PEO) must have a great understanding of Agile in a government context and be able to lead the team through any issue the bureaucracy creates as a roadblock.

- Train and certify the Contracting Officer in governance/administration of contracts with agile processes. SOW, SOO, CDRLs, etc need to be different than traditional waterfall processes
- Agencies need Coaches to move towards agility and adoption of agile principles
- Determine the right thing to measure (VALUE) versus effort (lines of code) or number of documents.
- Dean Leffingwell Scaled Agile Framework (SAFe) and UK Dynamic Systems Development Methodology (DSDM) are good examples of scaling agile and program management in an agile context.
- Develop a Performance Work Statement with a Statement of Objectives versus a Statement of Work.
- The RFP should state the desired solution versus requirements. There are great examples in the OMB Contracting Guidance to Support Modular Development (link on AFEI web site)
- Consider using Contracts to define EPICS before contracting for the development
- See GAO Schedule Assessment Guide, GAO 12-120G. May 2012 (can be downloaded from ADAPT page of AFEI web site).

3.3   Cafe Session 3 - ELIMINATE UNPRODUCTIVE PROCESSES

Facilitators: Matt Vandergrift, *ManTech*;
Champlin Jones, *Boeing*

Purpose
During this discussion we will review facts related to the cost of unproductive processes/activities and consider the impact on the government's need for greater efficiency while serving mission needs.

3.3.1   Description
Abstract
One of the goals of Better Buying Power 2.0 is to identify non-value added processes that the Department may be imposing on industry. Experienced 'agilists' and Lean-minded people/teams have a keen eye for wasteful processes and they often focus efforts on improving or removing them. The output of this discussion will be increased individual awareness about eliminating unproductive processes based on presented research and observations from group participants.

3.3.2   Introductory Questions and Participant Responses:
1. How can we measuring the cost of unproductive processes?
- Measure output once processes are removed
  - Measure a process based on the cost of the coordination.
- Moving recourses from coordination to development team can be measured.
- Identifying non-value added personnel in terms of product output
- Quantify the cost of documentation (price in man hours that could be spent on development)

2. What are success stories of eliminating or changing unproductive processes?
- We don't want to say no to management
- Lack of coordination can lead to project failures
  - F-35 program had problems with system architect not doing enough up front system engineering
  - The affects of change do not surface until years later

- Hard time changing culture with Senior Engineers
- Making changes with the experienced vs. the inexperienced can increase coordination in terms of training
- Not enough documentation to transition contractors or program phases
- Confusion between coordination and value

3. Where do we have control or influence?
- Education
  - Provide reporting cost to upper level managers and stakeholders
  - Provide the cost of reporting the same information to multiple sources and sometimes in different formats.
  - Teach the value of having sprint demonstrations over status reporting
  - Inform the customer – There is no "one size size fits all" approach. The Agile process is able to be tailored, which can help remove unnecessary processes (virtual meeting TIMS)
  - Identify problems with coordination cost (cost of processes)
  - Case studies
  - Opportunities proposal
  - Use models
- Practices
  - Implementing a money clock (e.g. cost of unnecessary people attending meetings)
  - Try to propose change in increments
  - Implementing an agile (strategic & technical) coach to help eliminate coordination cost (cost of processes)
  - Removing travel and face-to-face meetings has reduced meeting time & cost.
  - Leaves more time for development.
  - Implementing Agile Technical practices
  - Use already existing standards
  - Never re-writing documentation (on-line collaborative documents?)
  - Using life cycle management tools for reporting and CMMI/ISO compliance
- Negotiate
  - Working with customer to negotiate necessary processes before everything starts.
  - Ask the question why!!
  - Propose to delay decisions on non-critical features
  - Asking for a waiver

4. Where do we have neither?
- Coordination/Process Cost is driven by government (customer)
- Reporting on multiple levels
- CDRL requirements – (Example: updating CDRLs after each Sprint)
  - Stage Gate reviews

3.4   Cafe Session 4 - WORKFORCE TRAINING

Facilitators: Richard Cheng, *Excella*
                              Dr. Matt Kennedy, *DAU*

Purpose

This facilitated group discussion will explore the area of workforce training and certification. In particular, the session discusses the need for training and certification of procurement, contracting and program management professionals in the governance and oversight of acquisitions incorporating agile processes.

3.4.1   Description

Abstract

Agile principles and methods provide advantages that an increasing number of Federal programs are embracing. When implementing Agile frameworks, there must be a shared baseline understanding of the Agile principles and processes. How does the government ensure that our Federal workforce and programs are effectively trained, coached, and empowered to enable Agility on Federal programs?

Introductory Questions:

1. What kind of training and certifications are needed?
2. Who needs to be trained?
3. At what levels are the training needs best being met?
4. Where are the biggest training gaps and how can the gaps be addressed?
5. Differences between training and coaching?

4.4.2   Summary and Discussion Results

In addressing the introductory questions the group synthesized the responses and discussion into two areas: issues and ideas to address them.

Issues in workforce training and development in the use of agile methods:

- People state they want Agile but don't truly understand what that means
- Inconsistent terminology is often used
- Management saying "You are doing Agile, we don't need to"
- Acquisition/Contracting professionals with limited understanding of Agile (CO have little incentive to change)
- Middle layers in government misunderstandings of Agile
- Cultural issues and changing culture
- Finding money to train people
- Some Agencies don't understand a need for Coaching

Ideas for addressing the identified training issues

- Training needs to occur at all levels
- We also need tailored training targeting specific skills and roles. This includes
    - Project Managers, Program Managers, and other members of PMOs
    - Contracting Officers, Contracting Officer Technical Representatives and others in acquisition and governance functions
    - Executives
- Coaching to work with the organization/teams to effectively implement

- o Training is a great start to create fundamentals to get a shared baseline understanding of concepts and a common language, but Coaching is critical to on-going program success when implementing Agile
- Creating a training roadmap
  - o Start with initial training
  - o Follow up with Coaching
  - o Continue with advanced training for the advanced concepts
- DAU has some Agile materials and they are targeting web based training as a lower cost alternative to in person training

3.5 Cafe Session 5 - CONCURRENCY, PROGRAM MANAGEMENT AND GOVERNANCE

Facilitators: Richard Turner, *Stevens Institute*;
Don Almeida, *Northrop Grumman (IS)*

Purpose
This group will discuss ways to reconcile key management and governance expectations with the principles and needs of agile teams.

3.5.1 Description
Abstract
To meet the accelerating need for software capabilities, many organizations are conducting rapid, highly concurrent research, development, acquisition and deployment activities. To handle this concurrency, researchers and developers are employing agile technical and management approaches. Unfortunately, traditional governance processes and management tools were not designed for these approaches. Mismatches in available and expected information may fail to provide the necessary insight and information for command decisions, appropriate oversight, and prudent evaluation of resource expenditure.

Introductory Questions:
1. How can agile software development projects better demonstrate that their project information can be effectively incorporated into traditional program measurement tools and plans such as Earned Value Management, Integrated Master Schedules/Plans, and System Engineering Plans?

2. What specific visibility (in terms or measures, artifacts, demonstrations) is required in order for product owners and oversight organizations to feel comfortable that concurrent and agile approaches are on track and providing the expected value?

3. Are there adjustments to the traditional methods required to better account for the concurrency and uncertainty associated with agile and other rapid development methods?

4. Are there adjustments to the agile approaches required to support the government requirements for technical documentation in the case of organizational evolution, contractor dissolution, or re-compete?

3.5.2 Summary and Discussion Results
In addressing the introductory questions the group synthesized the responses and discussion into three areas as follows:

1) Keeping oversight folks comfortable with agile processes

    a) Congress/JCIDS/POM and budgeting
    b) Executives (3-star, operational focused, mission driven)
    c) Bean Counters (CAIG, Business mgrs, Budgeteers, Scrutineers)
    d) Contracting officers
2) How to engage all stakeholders
    a) Other programs/projects
    b) Training, logistics, accounting
    c) Users, customers, public
3) What technical practices/approaches within agile/lean could help?
    a) Agile ≠Scrum
    b) Need to support the technical value

This session went on to expand on each of these three major areas.

1. Enablers of keeping oversight folks comfortable with agile processes
- Commercial practices rather than reinventing wheels
- Education on all in agile concepts, principles and values
- Introduce agilely
- Focus on capability rather than processes/practices
- Use language appropriate for executive (old or new)
- Introduce to young/raw folks early to reap benefits later
- Explain agile provides more control (over value, sequencing, deployment)
- Producing working stuff
- Good customer feedback as often as possible
- Pain-based marketing

2. How to engage all stakeholders
- Barriers
  - Poor surrogate users/product owners
  - Not Collaborative, Responsible, Acknowledged, Committed, Knowledgeable (CRACK)
- Enablers
  - Incorporation into project; user engagement
  - Champion/executive support

3. What technical practices/approaches within agile/lean could help?
- Prototyping/Model-based Engineering
- Continuous builds/integration/validation
- COTS
- Automatically generated metrics
- Architectures
- Test-Driven Development (and its accouterments)
- Kanban
- Risk Burndown Chart
- Value-based decision making
- Quality engineering and validation (e.g. -ilities)
- Information radiators (e.g. dashboards)

Discussions in different sessions: (key points)
- Political agendas: Model based engineering, follow industry models. Do not reinvent the wheel.
- Culture, inability to change, use cots product, expanding mission scope.
- We could use a house model. Begin with a base model and then add more things to the house. Keep a fixed price base model. Example: a house with a kitchen, bathroom, bedroom etc. then add more to it as we go along.
- Inverted iron triangle (See DSDM methodology discussion)
- Change management / communication automated workflow pick list.
- Stakeholders are not interested. Product owners can be very strong at times. The word "owner" could make one uncomfortable. Command and control behaviors. Hierarchical industry.
- Agile produces working stuff, there is evidence.
- Agile should be introduced in an Agile way. Small bits at a time.
  - Tailored upward approach to convince executives or pass on information
    - Start with what you need. Then move up the chain.
    - Static analysis.
- Quality is seen separately? Why? Shouldn't Quality be seen as part of the scope? Customers usually say that they need feature X. Quality is implied.
- Executives need feedback. How do we give executive feedback? How do they know that agile is working?
- What's in it for the executives? How do we sell them Agile?
- Currently projects are managed by Projects not capabilities.
- Executives need to talk the Agile language.
- Executives are political.
- Customers need to have quality products. Quality needs to be defined upfront.
- Feedback at executive level/ Metrics --? Capability matrix.
- Kanban. Executives don't get a report from the Kanban board.
- Product features should be prioritized based on value. Use a Value weighted matrix.
- How do we get agile started. How do we get support.
- Visibility of the whole process at the executive level.

Participating Organizations

American Systems Corporation
ASD NII
Assistant Secretary of the Air Force (Acquisition)
Boeing Company
British Embassy
Center for Technology and National Security Policy
Chief of Naval Operations, Navy Expeditionary Combat Branch (N857)
David Consulting Group
DCMO
Defense Acquisition University
Defense Threat Reduction Agency
Department of Defense-OSD
Department of Homeland Security (DHS)
Deputy Under Secretary of Defense for Intelligence
DSDM Consortium
EPA
Engility Corporation
Excella Consulting
Galorath Incorporated
General Dynamics-Advanced Information Systems
GreenLine Systems, Inc.
ICF International
Joint Improvised Explosive Device Defeat Organization
The Johns Hopkins University/Applied Physics Lab
Lockheed Martin Corporate Engineering
Lockheed Martin Corporation
The Mayvin Consulting Group
ManTech International Corporation
The MITRE Corporation
National Geospatial-Intelligence Agency
Naval Enterprise Network
Naval Sea Systems Command
Northrop Grumman Information Systems
OPM
OPNAV N2/N6BC
Organizational Strategies Inc.
PEO Enterprise Information Systems
Raytheon IIS
RF Logistics, LLC.
Software Engineering Institute
SteveDenning.com
Stevens Institute of Technology
Trideum Corporation
U.S. Army RDECOM - NVESD
U.S. Bureau of Labor Statistics
U.S. Government Accountability Office
U.S. Navy