

NDIA Agile Scrum Workshop 14-15 Nov 2011*PRODUCT: White Paper of Practitioner's Concerns,
Submitted for Policy Makers' Consideration*

Overview and Objective

NDIA sponsored an Agile Scrum Workshop for two days in November 2011. The National Defense Industrial Association has a history of promoting issues and solutions for topics relevant to that namespace for the betterment of our country and this event was the second in a series focused on one of the most critical issues facing DoD: responding to the NDAA 2010, Section 804 mandate to reform the acquisition of information technology in general, and of software development in particular.

This workshop implemented the idea of *using* Agile methods to shape DoD's Agile solution. Specifically, the workshop had three objectives:

1. Attendees needed to learn some agile software development values and principles with specific emphasis on scrum (a leading agile method practice). This was an education goal, focused on the participants.
2. The participants – whose backgrounds are varied – would use agile practices to deliver a product of value in a very short period of time. They would provide content for a document and presentation which would give an unvarnished voice to their concerns on a direct line of communication to the DoD leadership formulating the policies. This paper and its associated presentation are the fulfillment of that objective, and it is focused on you, the DoD policy maker.
3. The United States, and DoD in particular, are a force for good. What our warfighters do matters to our country and shapes our world. Therefore, their tools matter, none more so than those tools used in their information management sphere. Give them better tools, produce better outcomes. Successful implementation of agile will give better tools. The organizers hold the subversive idea that the true objective of this workshop was to change the world.

The NDIA realizes and acknowledges that this whitepaper is truly unvarnished. It has not been widely reviewed, coordinated, and polished. Its value is realized two-fold. First, speed is important. A 70% solution in a short amount of time is infinitely better than the 95% solution which actually never gets delivered. This should be recognized as a reflection of an agile mindset. Second, true or not, the ideas expressed in the remainder of this document reflect the perceptions of a significant sample of early adopters within the population facing the daunting task of implementing new policies and practices. In change management perception is reality. The workshop participants believe the statements (and the implied assumptions) which follow to be true. If you, as the policy maker, know the statement or the assumption to be invalid, then this suggests a requirement for more communication. There is no such thing as too much communication when we are trying to achieve culture change on the scale of DoD.

Four Ideas

The participants used the open space format¹ to generate a backlog of ideas for exploration and consideration. These ideas, the germs of user stories², were groomed and assigned to teams. The teams

¹ "Open space" is a particular type of meeting or conference format that uses minimal structure to elicit the concerns and ideas that are central to the attendees, rather than pre-supposing the topics that will be of interest to them.

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collaborated to prioritize, refine, and task them out. Near the end of the workshop the four highest priority stories were presented by conference attendees using markers and flip charts to

- Dr. Steven J. Hutchison, Office of the Director, Defense Research & Engineering / Research Directorate, Principal Deputy, Developmental T&E, and to
- Mr. Mark E. Krzysko, OSD Deputy Director, Enterprise Information & OSD Studies.
- Mr. Ronald W. Pontius, Office of the Assistant Secretary of Defense for Networks and Information Integration, Director, C2 Programs & Policy, was also in attendance.

The remainder of this document captures those ideas and adds some details as they were expressed in the working groups.

1. Culture Change in DoD Requires a Program Focused on the Middle Tier-- SES and Program Managers in the Acquisition Apparatus

The perception is that, for the most part, the senior level of DoD leadership “gets it” when it comes to the need to adopt a more agile set of capability delivery practices. The implementation levels of effort (mainly contractors) also “get it”. They know Agile is a mindset, not a prescriptive set of practices. However, it appears that the usual forces which threaten any change effort are not being adequately addressed. Agile is beginning to be thought of in the same manner as other historically significant change efforts which failed miserably. Resistance to change is natural, predictable, and not all bad. In an organization the size of DoD it generates inertia of monumental proportions. If there is not a specific program adopting well-documented concepts to effect change, the historical probability is that this effort will fail. The attendees suggest several vectors focused on culture change.

- ***Leadership needs training too.*** There are many in positions of authority who harbor misconceptions about agile. Some resistance to change is good and well founded. This type leads to better outcomes because it challenges and elevates reasonable concerns. However, there are many examples of decision makers expressing opinions which reflect fundamental divergence from the reality of truly agile mindsets and practices. This divergence will not be adequately addressed by simply waiting until this age group matures out of the population.
- ***Incorporate agile in the curriculum at DAU, begin now to institutionalize it for the next generation.*** Emphasize the mindset, the values and the principles. It is not about the practices. Teach practical techniques by which to measure the degree of agility needed and present in an acquisition effort.
- ***There is no single agency that, once converted to “the Agile way”, will ensure successful outcomes for DoD.*** The acquisition apparatus in DoD is many headed. A program of assistance and training is needed for the Senior Executive level, and for the program managers charged with leading the individual efforts. One sign that this is necessary is the oft- repeated anecdotal evidence of program managers who are valiantly attempting to implement agile methods, yet are constantly pounded to produce traditional documentation. This is an absolute red flag, a

² A particular way of communicating requirements used in several agile methods.

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harbinger of bad outcomes. The Staff Assistance Visit (SAV) is a well recognized device across DoD operational units, but glaringly absent in the acquisition world. This may be a near term vehicle for assisting program managers and PEOs who are trying to make desirable changes.

- **DoD does not need an Agile Champion. It needs an Agile Champion in every organization.** Program Managers need mentoring and sponsorship and competing forces need to see they have that mentoring and sponsorship. Too often the PM is given the green light to “try agile”, then any bad outcomes that result from an undereducated program office trying new practices are assumed to be related to the method itself.
- **Good outcomes require an agile environment for a program to flourish.** One published intention of DoD policy makers is to establish pilot programs to demonstrate agile success. This is an expression that change comes slowly, and that we should generate small wins. We don't need pilot programs, we need pilot environments. Too much is expected of a PM to go out and practice agile within the realm of her control, with the expectation that elements outside of her control can be ignored. If you want to generate wins then all of the stakeholders need to sign on to the agile mindset, understand the values and accept the practices tailored for the effort.
- **Having policy makers attend events such as this one to express their understanding and support, their intentions and their actions, is helpful but it is not adequate.** Having said that, one of the most frequent comments heard at the 2nd day's afternoon break was how much the attendees appreciated the presence, attention, and candor of the policy-level panelists. Most of the attendees at these events are from the industry side of the house. The government side is grossly under-represented and contractor experiences indicate the government employees are still largely uninformed and ill disposed to become the early adopters. They are not getting the message to lean forward and make this happen.

2. DoD needs Multiple Agile Champions

The problem identified is that an Agile Champion is required to enable the cultural change to support adoption of Agile. DoD needs to create buy-in from all organizational levels and this is facilitated by a visible, empowered champion. Since there is no single acquisition organization this Champion needs to be cloned and distributed. An Agile Champion has the following attributes:

- Agile Awareness: knowledge that goes beyond Power Point deep
- Credibility: Significant Agile expertise and experience
- Passion: an enthusiastic true believer
- Empowered: organizational influence and voice
- Has courage, guts, and tenacity

The Agile Champion would embody as many of the following traits as possible:

- Operate and successfully communicate at all levels of the organization from executive to the project and to the teams
- Describe the benefits of Agile by providing real data, case studies, and examples of customer satisfaction based on the early, visible delivery of working software

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- Provide and communicate the vision required to actually transform an organization, not simply reformat one
- Manage stakeholder expectations, to include the resource providers, the users and the implementers; those developing the software are stakeholders, too
- Be unapologetic in the Agile rollout in the organization

The benefits of establishing a champion and employing this approach include (but are not limited to):

- Helps address the concerns about the effects of the transition
- Acts as the focal point for Agile's deployment
- Provides a ready and primary source of information for the organization's Agile implementation
- Has cross functional authority to remove obstacles

Workshop recommendations for the Agile Champion's implementation:

- Create a vision on how to accomplish this change
- Commandeer resources as required
- Stack the deck--create "all star" teams/projects
- Demonstrate success
- Practice retrospectives
- Celebrate success

3. Evolve the Systems Engineering Concept in an Agile Development Model

Critical decisions about a program's deployment model, technology base, data structure and other fundamental considerations are the arena of the Systems Engineer. These decisions can have far reaching and costly implications for any program. In a traditionally executed software project, in an attempt to mitigate risk, the development of the product is typically delayed substantially until these major considerations are examined, discussed, vetted, determined, written down and then codified in contract language. This phase of a program and this type of execution of systems engineering places a chokehold on the development team and is a substantial factor contributing to the current, inefficient methodology and resulting outcomes. To advance the concept of Systems Engineering in an Agile Development model the stakeholders must become comfortable proceeding without the false security of well documented, yet ultimately irrelevant, requirements. Instead, the program needs:

- A vision and roadmap including the project charter or (Agile) project execution plan. This level-sets the overarching goals of the project while allowing requirements definition to evolve during the project. The vision and initial roadmap identifies all relevant roles, critical artifacts, and time-boxed working sessions that are to be conducted throughout the project lifecycle. In that way it is a tailoring tool.

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- Only those Systems Engineering activities and artifacts required for the activities at the Tier 1 level that are necessary (value-adding) in order to support requirements, and the functional analysis and design synthesis that results in refining requirements at later stages.
- To move away from milestone reviews. This is among the most challenging propositions. There have been several alternatives suggested, including continuous "Agile Surveillance Points" that could ultimately replace the high overhead PDR/CDR milestones. They consist of a series of releases that are completed through a series of short (no more than 4 weeks each) iterations, where select releases (not all releases) include some level of formality and a review of all completed work during a short technical interchange meeting (TIM).
- Systems Engineering resources including embedded users - the right people selected for the duration of the project to understand and communicate to the developers the challenges and risks the evolving system is encountering and creating. This has significant risk mitigation effects.
- Agile Systems Engineer teams structured within the Scrum framework or similar to execute work activities to collaboratively develop and evolve the requirements after project initiation.

Considered by some a controversial subject, the role of Systems Engineering in an Agile development construct requires specific investigation and elaboration. In the past a large amount of the Systems Engineer's work has been accomplished prior to issuing an acquisition contract. However, when the Agile contract is let prior to establishing those details, the function of the System Engineer must evolve to add his value to the project at a point later in time.

4. Contract Issues Must be Addressed

Like no other, this is the arena where there were many more questions from attendees than there were suggestions for answers or awareness of solutions. That is to be expected, as the entire paradigm of acquisition revolves around the government codifying requirements in a document called a contract, then each party to the contract rigorously adhering to the letter of the document. It would be folly to believe Agile will change human (or corporate) behavior, but would it be folly to believe that there exists contract language that could leverage human behavior to achieve the common objective? These were the questions that dominated the conversation:

- How to adjust scope post award?
- How to define deliverables, data rights to enable sustainment?
- How to ensure transparency and visibility into contractor performance?
- Is there a template?

We know that these questions have been fully answered by different contributors to the Agile cause. Perhaps the most relevant observation to be made on this topic is the unfamiliarity that this constituency has with those answers. This was not an ignorant population in attendance. The fact that so many are so unfamiliar implies that mistakes are being made with every new award. The knowledge of preferred Agile contract types, or preferred language and clauses, should already be widely known. The dilemma of attempting to practice Agile methods on a firm fixed price is easily, yet rarely, avoided.

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This is not an area that each Program Manager should be faced with learning about and advocating for. Those answers need to be disseminated. Some key attributes of an Agile-friendly contract include:

- The most flexible language possible to facilitate collaboration between the government and the contractor
- High level description of goals while detailed description is moved into a supplemental document
- Incentivize Agile behavior with award structure, to include individual and team performance
- Resolve the paradox of EVM when the Agile methodology ensures cost and schedule estimates will be met, and only scope is in question

The Agile methodology requires a collaborative effort between the contractor delivering the vision, and the government customer communicating that vision. If the contract is written such that the developer does not have a stake in the vision, only in the specified provisions on the contract, then the behavior will be akin to that of mercenaries. It is an inevitable and natural outcome of such a relationship. However, if the desired outcome is delivery of a vision, the contractor must be recognized as a key stakeholder, not simply the provider of a service. Government Program Leadership must recognize this when the vehicle is selected. Some additional considerations include:

- Absolute minimum number of KPPs to satisfy capabilities needed
- Specify the verification and validation threshold for success
- Scope includes the mission/purpose of the system being delivered
- Time of execution is specified in any contract. It is implausible to precisely specify cost, schedule and scope in a realm where requirements are not completely defined, so don't attempt it
- Identify an apparatus to permit evolution of the initial "Big-R" requirements and protocols supporting the anticipated revelation of "small-r"; Agile welcomes change so build in a responsive change protocol

Summary

The authors of this white paper understand very well that there are no issues discussed here that have not been discussed elsewhere, and by more eloquent and learned practitioners. That is not the point of this exercise at all. The objective is to support the movement of DoD towards the goals of NDAA 2010, Section 804 acquisition reform. If one accepts the premise that this goal requires a cultural change (and this refrain is heard in every conference and conversation on the topic, so most do accept this) then one must accept the premise that such a change must be focused on the personnel of the organization, not merely its processes. People support that which they help to create. Frequently, simply the knowledge that they have a voice, that their concerns are being heard, is enough to achieve the buy-in so fundamental to real change. This NDIA-sponsored workshop was specifically designed to give DoD Agile practitioners an unfiltered voice directly to the DoD policy makers.

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A second take away from this paper should be the recognition that what the DoD acquisition implementers search for is summarized by one word: leadership. Our belief is that at its very core, that is exactly what Agile is: the application of sound leadership principles in a software development and acquisition construct. Demonstrate it, enable it, demand it. Reference the third objective of the workshop; by this we will change the world.

Contributing Practitioners

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|---------------------------|---|---|
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| Mr. Rob Beutel | USTRANSCOM J6 AT21 | Enterprise Integration |
| LTC (Ret) Louis George | U.S. Army Test and Evaluation | Evaluator |
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| Mrs. Carmen Shimer | Graver Marine Corps Systems Command Branch Head | Software Engineering |
| Mr. Richard Hammond | | |
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| Mr. Gregory Howard | Northrop Grumman | Electronic Systems |
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| Ms. Suzanne Miller | Software Engineering Institute | Senior Member of the Technical Staff |
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