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Practical Considerations in Adopting Agile/Lean in Government Settings

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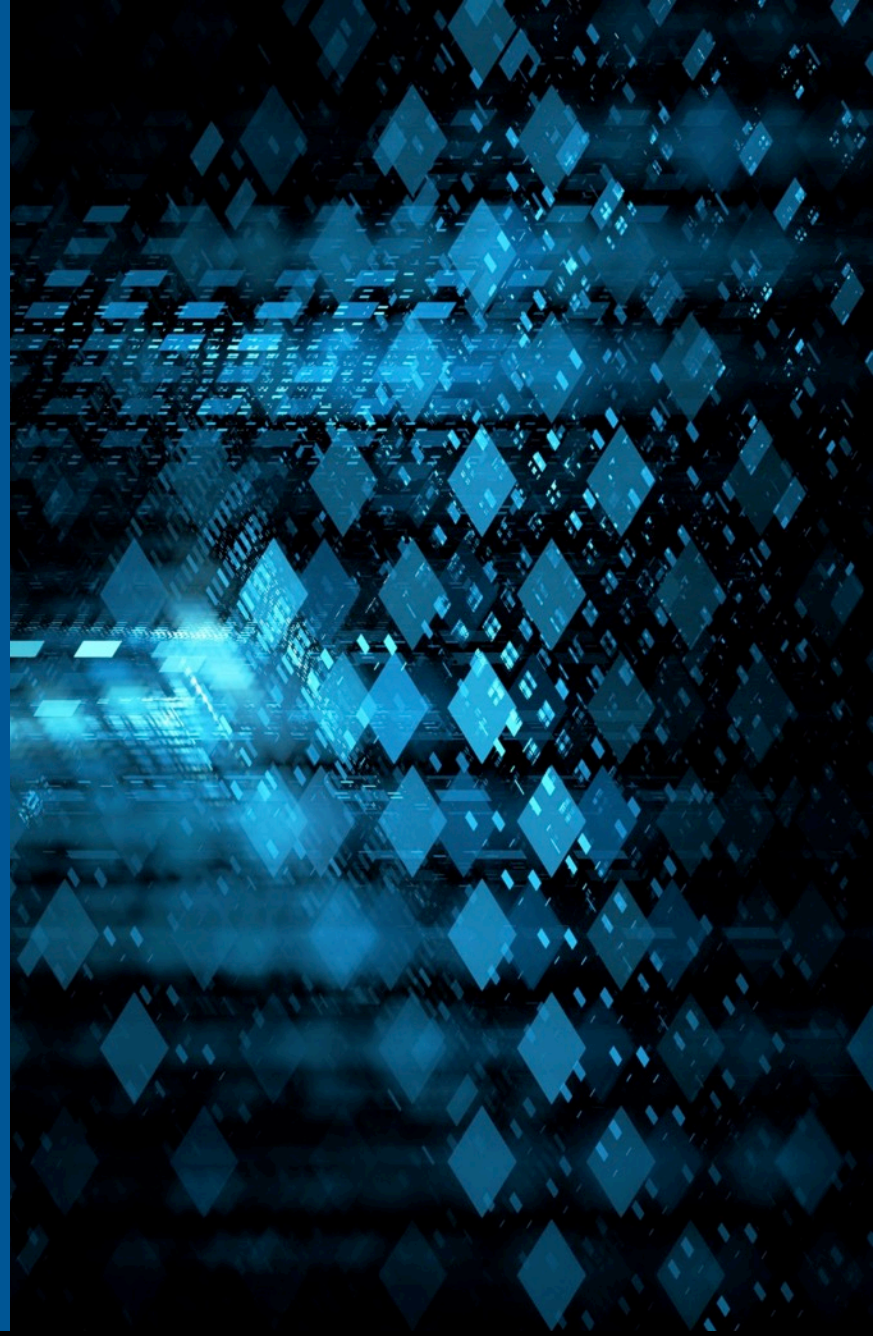

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Agenda

Setting the Stage

Interpreting Agile & Lean Principles in Government Settings

The Eco-System of Agile in Government

Gimmees and Gotchas in Adopting Agile/Lean in Government

Getting Off the Stage

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Setting the Stage

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Polling Question 1

Which of the following best characterizes your interaction with Agile/lean methods?

a) Government program contemplating using Agile/Lean methods
b) Government program currently using Agile/Lean methods
c) Government program that considered using Agile/Lean methods but decided against it
d) Government contractor currently using Agile/Lean methods for government work
e) Agile team or enterprise coach working in or has worked in government settings

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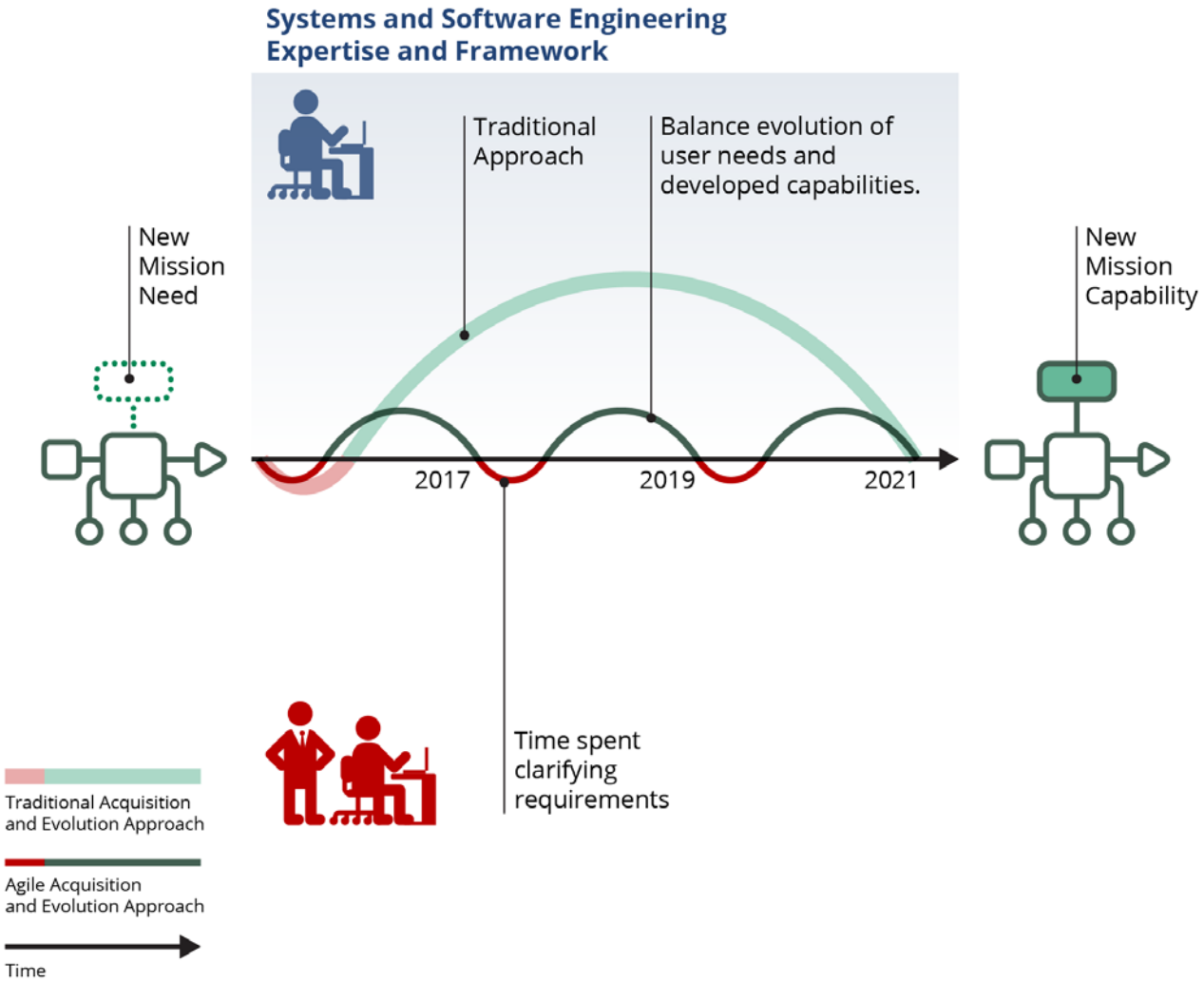
Motivation for Agile: Gov't Acquisition and Innovation

Many regulated environments, like the DoD, NEED innovation and NEED incremental improvements to their systems.

Many of them are now willing to consider changing their approach ***if they can do it without getting in trouble with their governing statutes and regulations.***



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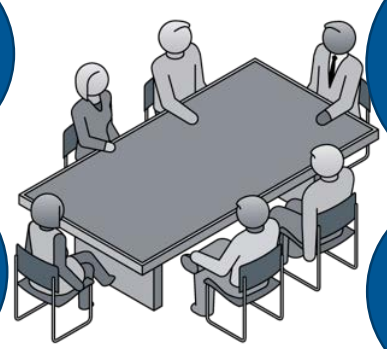
Agile Collaboration Group – Growing since FY12

Allows SEI to seek feedback from and influence the work of Agilists in the Defense and Federal space

- **170+** members
- All 4 branches of service
- OSD, DISA, DAU, DCMA, MDA
- 13 other Federal agencies & FFRDCs
- 37 industry orgs.



- Annual in-person colloquium lauded by members as uniquely valuable
- Share resources, org. policies, and assets with SEI and larger group
- Monthly telecon w/member speaker series
- Members refer other members, and *refer new SEI business*
- Feedback on research and transition agenda priorities
- Questions, concerns, and experiences feed our research
- Co-author /review publications

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Interpreting Agile/Lean Principles for Government Settings

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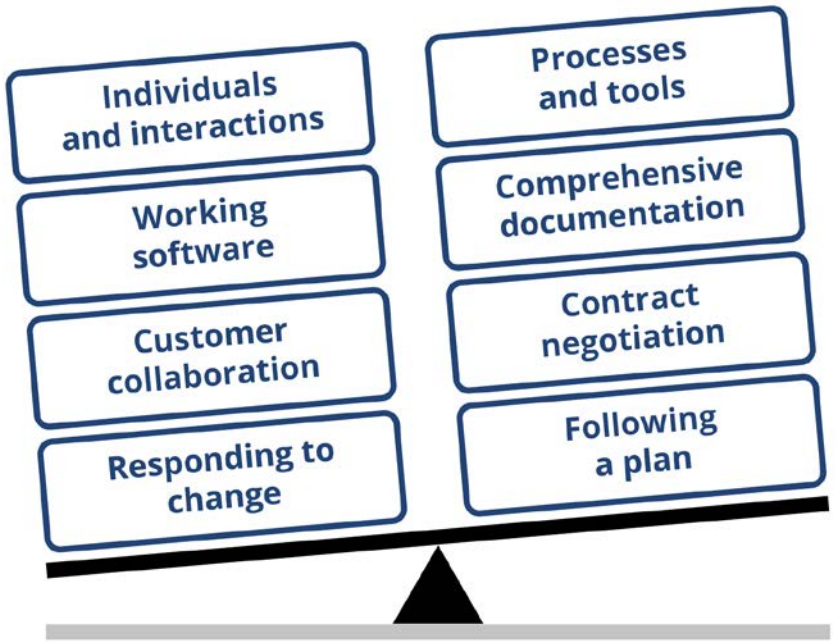
Agile Manifesto—STILL the Basis for Agile Thinking in Industry

Through this work we have come to value:



That is, while there is value in the items on the right, we value the items on the left more.

Common myth:

The manifesto is often misinterpreted to mean:

no documentation, no process, and no plan!

http://www.agilemanifesto.org/

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Polling Question 2

Which of the following groups of Agile Principles would you like us to focus on?

a. Principles related to requirements and engineering
b. Principles related to teams and stakeholders
c. Principles related to small batches and cadence

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Useful Interpretation of Agile Principles for Government Settings
(1/3)

Agile Principle	Useful Interpretations in Government Settings
The highest priority is to satisfy the customer through early and continuous delivery of valuable software.	In government, the "customer" is not always the end user. The customer includes people who pay for; people who use; people who maintain; as well as others. These stakeholders often have conflicting needs that must be reconciled
Welcome changing requirements, even late in development. Agile processes harness change for the customer's competitive advantage.	Rather than saying "competitive" advantage, we usually say "operational" advantage. This principle causes culture clash with the "all requirements up front" perspective of many large, traditional approaches.
Deliver working software frequently, from a couple of weeks to a couple of months, with a preference for the shorter timescale.	What it means to "deliver" an increment of software may well depend on context. With large embedded systems, we are sometimes looking at a release into a testing lab. Also, for some systems, the operational users are not able to accept all :"deliveries" on the development cadence – because there are accompanying changes in the workflow supported by the software that require updates.
Business people and developers must work together daily throughout the project.	In government settings, we interpret "business" people to be end users and operators, as well as the other types of stakeholders mentioned in Principle 1, since in many government settings, the business people are interpreted as the contracts and finance group.

Source: SEI Congressional testimony July 14, 2016 to House Ways and Means Committee.

http://waysandmeans.house.gov/wp-content/uploads/2016/07/20160714SS-Testimony-Hayes.pdf

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Useful Interpretation of Agile Principles for Government Settings
(2/3)

Agile Principle	Useful Interpretations in Government Settings
Build projects around motivated individuals. Give them environment and support they need, and trust them to get the job done.	A frequent challenge in government is to provide a suitable technical and management environment to foster the trust that is inherent in Agile settings. Allowing teams to stay intact and focused on a single work stream is another challenge.
The most efficient and effective method of conveying information to and within a development team is face-to-face conversation.	In today's world, even in commercial settings, this is often interpreted as "high bandwidth" rather than only face-to-face. Telepresence via video or screen-sharing allows more distributed work groups than in the past.
Working software is the primary measure of progress.	Out typical government system development approaches use surrogates for software – documents that project the needed requirements and design – rather than the software itself, as measures of progress. Going to small batches in short increments allows this principle to be enacted, even in government setting, although delivery may well to be a test environment or some internal group other than users themselves.
Agile processes promote sustainable development. The sponsors, developers, and users should be able to maintain a constant pace indefinitely	This principle is a caution against seeing agility just as "do it faster." Note that this principle includes stakeholders outside of the development team as part of the pacing.

Source: SEI Congressional testimony July 14, 2016 to House Ways and Means Committee.

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Useful Interpretation of Agile Principles for Government Settings
(3/3)

Agile Principle	Useful Interpretations in Government Settings
Continuous attention to technical excellence and good design enhances agility	This is a principle that often is cited as already being compatible with traditional government development.
Simplicity– the are of maximizing the amount of work not done– is essential.	One issue with this principle in government setting is that our contracts are often written to penalize development organization if they don't produce a product that reflects 100% of the requirements. This principle recognizes that not all requirements we think are needed at the onset of a project will necessarily turn out to be things that should be included in the product.
The best architectures, requirements, and designs emerge form self-organizing teams.	Note that the principle does not suggest that the development team is necessarily the correct team for requirements and architecture. It is however, encouraging teams focused in these areas to be allows some autonomy to organize their work. Another complication in many government settings is that we are often re-architecting and re-designing existing systems.
At regular intervals, the team reflects on how to become more effective, then tunes and adjusts its behavior accordingly.	This principle is an attempt to ensure that “lessons learned:” are actually learned and applied rather than just being “lessons written”

Source: SEI Congressional testimony July 14, 2016 to House Ways and Means Committee.

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What are the Agile tenets and principles trying to enable?

1. Increase speed of development of high business value software
   - Speed=the time it takes to move ideas from one person to another
   - A reason that all Agile approaches emphasize face-to-face contact as much as possible
2. Take advantage of the benefits of small batch sizes
   - Fast feedback, fast learning, etc
   - What is the next smallest thing I can do that increases the business value delivered?
3. Reduce non-value-added work and rework
   - Reduce “time to fielding”
   - BUT understanding what is truly non-value added
     - Non-value for designer may be HIGH value for sustainer

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Going Beyond Small Teams Adds Complexity

Lots of things beyond supporting a small team that you have to focus on when scaling above a few small teams, regardless of software or systems context:

- Managing the interfaces among the many products/system components that multiple teams are working with…
- Figuring out how to synchronize releases and events across multiple teams…
- Figuring out how to get the inventory (backlog) of requirements organized productively to support the development pace of multiple small teams….
- Dealing with specialty disciplines (UX, security, etc.) that have significant inputs to the evolving product, but aren't needed as full time team members….

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SAFe is Also Principles Based – Lean Engineering and Startup Principles

#1 - Take an economic view

#2 - Apply systems thinking

#3 - Assume variability; preserve options

#4 - Build incrementally with fast, integrated learning cycles

#5 - Base milestones on objective evaluation of working systems

#6 - Visualize and limit WIP, reduce batch sizes, and manage queue lengths

#7 - Apply cadence, synchronize with cross-domain planning

#8 - Unlock the intrinsic motivation of knowledge workers

#9 - Decentralize decision-making

http://www.scaledagileframework.com/

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The Eco-System of Agile in Government

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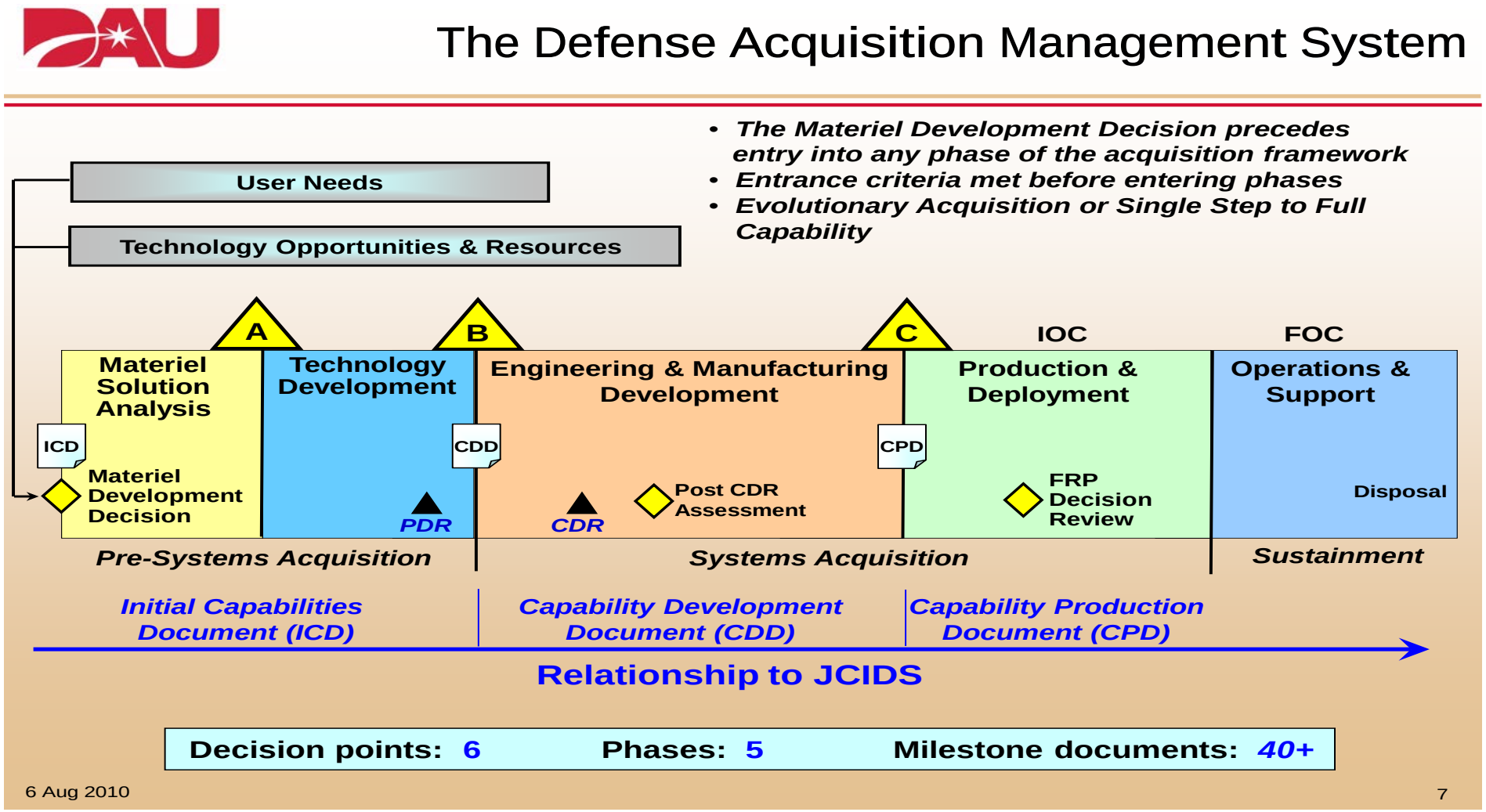
Agile Methods are Used in Context of a Larger Program (More Often Than Not)



Palmquist, Steven; Lapham, Mary Ann; Garcia-Miller, Suzanne; Chick, Timothy; & Ozkaya, Ipek. Parallel Worlds: Agile and Waterfall Differences and Similarities. CMU/SEI-2013-TN-021. Software Engineering Institute, Carnegie Mellon University. 2013. http://resources.sei.cmu.edu/library/asset-view.cfm?AssetID=62901

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Components of the Eco-System

Components include but not limited too:

- Program Management Office
- Contracts
- Finance
- System Engineering
- User (end, interfacing system(s) users, etc)
- Stakeholders
- Information Assurance
- Supply Chain
- Developers
- Testers
- …….

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Gimmees and Gotchas

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Polling Questions 3& 4

Are you working in a government setting that has used Agile or lean methods in the past and they were considered successful at helping you meet your acquisition's or system's goals?

a. Yes
b. No
c. Not Sure

Are you working in a government setting that has used Agile or lean methods in the past and they were considered unsuccessful at helping you meet your acquisition's or system's goals?

a. Yes
b. No
c. Not Sure

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Gimmes & Gotchas

Gimmes are a list of behaviors that give you confidence that your program office and/or contractor is embracing an agile process.

Gotchas are a list of behaviors that may indicate problems currently exist or on the horizon in your agile program.

These Gimmes & Gotchas **are not** intended to be all inclusive nor are they a checklist. The goal of these is to help identify areas to investigate further and focus your energy toward a successful program.

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First Steps Gimmees

- Your motivation, trade-offs, benefits, and expectations for using an Agile approach are clearly understood and communicated
- There is an explicit understanding that the requirements are expected to evolve
- Automated testing is planned for and budgeted
- Contract and CDRLs allow flexibility and incremental delivery
- Entire program team is aware that the Jan 2015 DoD 5000.02 has new lifecycle descriptions that support more "agile" approaches
- Hindrances and enablers for agile implementation are acknowledged
  - paths to success are identified, preferably through a method like SEI Readiness/Fit Analysis

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First Steps Gotchas

- Senior managers and stakeholders reluctant to use agile or are unaware that Agile is in use
- Software development is constrained to a hardware-based Work Breakdown Structure
- Mindset that document completion equals progress is prevalent
- Program exhibits a risk averse culture
- Integration testing isn't planned to occur until just before final delivery
- Testing isn't budgeted until much later in the program
- Agile is being treated like a silver bullet

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Readiness Gimmees

- Your Agile approach has been tailored to best meet your program's needs
- Program office staff including systems engineers understand their role in the agile process you're using
- The agile manifesto and principles are understood throughout the organization
- Appropriate training has been provided for the entire organization
- Expectations and artifacts necessary for milestone decisions have been agreed to and documented
- Agile roles and responsibilities have been clearly assigned
- The definition of done has been established and includes what documentation is required for iteration and increment deliveries
- The program office is open to changing roles
- Leadership and staff are educated on differences from the way they are used to doing business
- Program develops and utilizes adoption support (communication and implementation) mechanisms

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Readiness Gotchas

- Your testing function/organization has not been integrated into the day-to-day activities
- Requirements stability, operating environment, and the evolution of the technology base has not been fully assessed
- Constraints are imposed for the sake of tradition
- Contract progress payments are based on "earned value" for the accounting period vs the Agile working cadence
- Regulations are cited as a reason not to embrace agile approaches

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Implementation Gimmees

- Users and other stakeholders can accommodate incremental deliveries
- Necessary and beneficial documentation has been identified
- Requirements can be prioritized without pushback
- Agile requirements constructs –stories, features, epics, etc. -- have clear completion criteria
- (Incremental)technical reviews are structured to understand technical issues and mitigate technical risks
- Iteration and release reviews are used to build a case to demonstrate readiness to pass milestone reviews
- Agile measurements are integrated into overall management metrics
- Measurements are focused on "are we producing sufficient value fast enough?“
- User requirements are validated during the creation of user stories and features
- The program office is changing how they perform them their responsibilities (e.g. incremental technical reviews, CDRL deliveries…)

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Implementation Gotchas

- Your program or contractor is proposing agile as a quick fix for existing failures on the program
- Team metrics are used for comparisons
- Users and stakeholders who are not actively engaged in the Agile processes can't adapt to small batch deliveries
- Oversight activities are abandoned
- Multiple organizational change initiatives compete with Agile for the attention of leadership
- Cadence of multiple interacting teams hasn't been synchronized
- Focus is on compliance rather than mission success
- Derived requirements can't be reprioritized based on what is learned in early development iterations
- Contractor leadership and engineering implementation staff are not aligned on process changes needed to support Agile delivery
- Incentives to contractor don't reflect Agile/lean principles

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Getting off the Stage -- Summary

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Key SEI Messages Related to Agile (Your “Agile Cheatsheet”)-1

Key SEI AIG Messages

- Agile is not a Silver Bullet, but can be useful in Government development settings
- Agile is principles-based, which means there isn't only "one way" to do it correctly -- look to the principles before evaluating an implementation
- Lean engineering is closely related to Agile at the principles level, and scaling frameworks for Agile can benefit from lean principles as their basis
- Acquiring contracted systems with contractors who use Agile implies a different set of relationships and approaches to achieving oversight and insight
- OSD acquisition guidance (i.e. 5000.02) doesn't prohibit Agile, although it never mentions Agile specifically
  - There are 3 model diagrams in 5000.02 that can be readily tailored to an Agile IT environment or an Agile weapon systems environment
- Any contracting approach can be used with Agile if done with awareness of how Agile would work in that setting; however, some key elements of contracting (regardless of contract type) must be attended to

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Key SEI Messages Related to Agile (Your “Cheatsheet”)-2

- Bringing in Agile to an acquisition office is a classic technology adoption problem, and we use classic technology adoption solutions to help organizations through it
- SAFe (Scaled Agile Framework) is the most frequently adopted scaling framework by defense contractors; that's why we teach it, not because it is always the best for every problem
- We will have customers that have "hard" or "soft" adoptions of SAFe; it is meant to be tailored. With soft adoptions (only using some of the principles, not calling it SAFe, combining with other approaches) we provide advice about the utility of their approach, rather than their level of conformance to the published framework.
- Most of our acquisition customers don't run a software development shop themselves (there are exceptions, of course). But understanding the basics of Agile team practices and lean system development practices is needed in the acquisition office so that appropriate oversight decisions can be made
- Scrum is the most frequently adopted Agile team practices framework; however, much of the work done in the SPO environment may be more amenable to a kanpan approach, if the SPO wants to "do" Agile, not just oversee it
- Measurement in an Agile context has to be defined and implemented carefully, to avoid incentivizing unproductive team behaviors
- SPO leadership who are engaged with Agile developments need to ask some different questions when evaluating progress/success of Agile for a team or at scale.

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To Learn More…

SEI's First Public Leading SAFe/Agile in Government 3 day course will be held in our Arlington office on May 9-11, 2017. Attendees can expect:

- In Depth Interpretation of SAFe and Agile for Government Settings
- SAFe Agilist Certification Test available for those who complete the course

Logistics and registration information can be found at:

https://www.sei.cmu.edu/training/p126.cfm?RL=training&WT.ac=RLtraining

For lots of resources related to our Agile Adoption in Government research and transition, go to:

http://www.sei.cmu.edu/acquisition/research

Our podcasts have been grouped into 2 Digital Collections. Find them here:

http://resources.sei.cmu.edu/library/asset-view.cfm?assetID=493556

http://www.sei.cmu.edu/podcasts/agile-in-the-dod/index.cfm

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