

*Stability and counterinsurgency
missions—the wars we are in—require
75% solutions in months*

Robert Gates, Secretary of Defense

Agile and U.S. Department of Defense

A companion white paper
to Agile Project
Management: Making it
Work in the Enterprise,
Second Edition

John Goodpasture, PMP



Forward to the 2nd Edition

Since the publication of this white paper with the 1st edition of *“Project Management the Agile Way: Making it work in the enterprise”* the U.S. Department of Defense (DoD) specifically, and the U.S. federal agencies generally, have embraced agile methods and practices for many IT projects.

There are three top level instructions that have come along since the 1st edition that are drivers behind acceptance of agile in the federal establishment. These instructions provide policy and acquisition guidance for all those that work for and do business with the federal acquisition system:

1. From the White House: *“Contracting Guidance to Support Modular Development”*¹
2. From the U.S. Congress: *“Effective Practices and Federal Challenges in Applying Agile Methods”*²
3. From the DoD: Instruction 5000.02, *“Operation of the Defense Acquisition System”*, January 2015 edition³

But, even before all those, in 2008, Defense Secretary Robert Gates gave all concerned a challenge: *“Our conventional modernization programs seek a 99% solution in years. Stability and counterinsurgency missions—the wars we are in—require 75% solutions in months. The challenge is whether in our bureaucracy and in our minds these two different paradigms can be made to coexist”*

Certainly his words were a motivation behind the 2010 defense budget authorization bill, section 804⁴, which moved DoD—and by the force of influence, federal

¹ This publication is from the White House Office of Management and Budget (OMB), June 14, 2012, available at no cost from: <http://www.whitehouse.gov/sites/default/files/omb/procurement/guidance/modular-approaches-for-information-technology.pdf>

² This study is from the U.S. Congress General Accountability Office (GAO), July 27, 2012, available at no cost from: <http://www.gao.gov/products/GAO-12-681>

³ This publication is issued by the authority of the Under Secretary of Defense for Acquisition, Technology, and Logistics (AT&L) from: <http://www.dtic.mil/whs/directives/corres/pdf/500002p.pdf>

⁴ This is the so-called section 804 driver, “House report 111-166 - national defense authorization act for fiscal year 2010 section 804--demonstration authority for alternative acquisition process for defense information technology programs” which called for “... the Secretary of Defense the authority to designate up to 10 information technology (IT) programs annually to be included in a pilot demonstration of an alternative acquisition process for rapidly acquiring information technology capabilities ... “



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agencies—a long way down the path to agile and iterative methods, and methods designed for rapid delivery. Indeed, the *section 804* direction was a real push for agile methods, if for no other reason than it had money behind it.

Consequently, section 804 has been widely cited in the years since as a call to arms in software acquisition, as it were. It seems that almost every industry association that has any bearing on the quality of software acquisition has weighed in with plans and advice. Other groups, like the SEI, have likewise joined in. And, many of the executive agencies and think tanks like Mitre⁵ have published standards, handbooks, and acquisition guidance.

Adding to the mix, various executive leaders of DoD have likewise given many public briefings and speeches supporting iterative and agile methods in one form or another. Official publications, like “*Crosstalk, the Journal of Defense Software Engineering*”⁶ have published dozens of articles on agile projects in the military software domain.

Instruction 5000.02

But, for the defense project management industry it all comes back to Instruction 5000.02. This instruction was modified in 2013 to have six acquisition models, and then refined in 2015. Of the six models, Model 3 is the one of most interest to agile proponents.

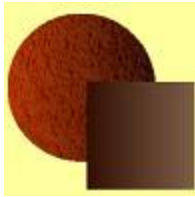
Quoting 5000.02 regarding “*Model 3, Incrementally deployed software intensive program*”:

“[Model 3] is a model that has been adopted for many Defense Business Systems. It also applies to upgrades to some command and control systems or weapons systems software where deployment of the full capability will occur in multiple increments as new capability is developed and delivered, nominally in 1- to 2-year cycles.

The period of each increment should not be arbitrarily constrained. The length of each increment and the number of deployable increments should be tailored and based on the logical progression of development and deployment for use in the field for the specific product being acquired.”

⁵ MITRE (mitre.org) a not-for-profit organization chartered to work in the public interest, having no commercial interests. Mitre has no owners or shareholders, and Mitre can't compete for anything except the right to operate FFRDCs (Federally funded research and development centers)

⁶ *Crosstalk* is free to all online at crosstalkonline.org



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The instruction regarding Model 3 goes on:

“This model is distinguished by the rapid delivery of capability through multiple acquisition increments, each of which provides part of the overall required program capability. Each increment may have several limited deployments; each deployment will result from a specific build and provide the user with a mature and tested sub-element of the overall incremental capability.

Several builds and deployments will typically be necessary to satisfy approved requirements for an increment of capability.....”

But, then there are caveats and warnings:

“This model will apply in cases where commercial off-the-shelf software, such as commercial business systems with multiple modular capabilities, are acquired and adapted for DoD applications.

An important caution in using this model is that it can be structured so that the program is overwhelmed with frequent milestone or deployment decision points and associated approval reviews.

To avoid this, multiple activities or build phases may be approved at any given milestone or decision point, subject to adequate planning, well-defined exit criteria, and demonstrated progress.”

Contracting is a clear and present issue

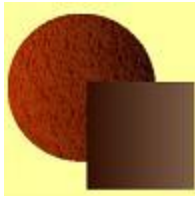
All that said, how do you square the principles of agile with the federal acquisition regulation (FAR) which largely envisions a traditional approach to software acquisition? Many have asked this question.

The answer begins with FAR section 39.103, Modular Contracting.

“Modular contracting is intended to reduce program risk and to incentivize contractor performance while meeting the Governments need for timely access to rapidly changing technology. Consistent with the agency’s information technology architecture, agencies should, to the maximum extent practicable, use modular contracting to acquire systems of information technology.”

Putting FAR 39.103 in day-to-day practical terms is the stuff of seminars and books, briefings, and, of course, numerous YouTube videos.

In the 1st edition of the book, I have my version. There is material about how to contract



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with agile using fixed price job orders hung on a pre-negotiated contract framework. This approach is now widely accepted. In the 2nd edition, some of the contract material has been refined.

However, since the 1st edition, the FAR has been interpreted to include many other contract innovations. Consequently, in 2014, the White House OMB and Office of Science and Technology Policy (OSTP) have jointly gathered a number of case studies into an informative document.⁷ Indeed, eight contract strategies are offered, including agile. All eight are aimed at either rapid deployment or research and development under conditions of uncertain requirements.

Acquisition practices

The White House, the GAO, and DoD all have guidance on acquisition practices.

- White House OMB/OSTP: “*Digital Services Playbook and the TechFAR Handbook*”, which were developed to improve the delivery of digital services by the Federal Government.⁸
- And, of course, the GAO has weighed in similarly on so important a topic with their handbook: “*Software development: Effective practices and federal challenges in applying agile methods*”⁹
- DoD has a number of manuals and guides that address agile methods, risk management, and architecture. Some are available from the Defense Acquisition University (dau.mil), or the Defense Technical Information Center (dtic.mil). Perhaps some of the best material comes from Mitre, a DoD think tank.

Mitre has developed the publication “*Defense Agile Acquisition Guide: Tailoring DoD IT Acquisition Program Structures and Processes to Rapidly Deliver Capabilities*”.¹⁰

⁷ “*Innovative contracting case studies*” from OMB and OSTP, the White House, available free at http://www.whitehouse.gov/sites/default/files/microsites/ostp/innovative_contracting_case_studies_2014_-_august.pdf

⁸ These publications are available at: https://playbook.cio.gov/assets/TechFAR%20Handbook_2014-08-07.pdf. TechFAR is a takeoff on the intersection of technology and the FAR (federal acquisition regulations). These documents are a product of the U.S. Digital Services agency, a unit of the OMB. They are distributed to the public by the OMB’s CIO council.

⁹ See: <http://www.gao.gov/products/GAO-12-681>

¹⁰ Available from Mitre: <http://www.mitre.org/publications/technical-papers/defense-agile-acquisition->



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The content here is comprehensive vis a vis system engineering, agile practices, scaling, and the like. Of course, this is not the only publication on this topic from Mitre; the organization has other guides for DoD practitioners engaged with agile

Summary

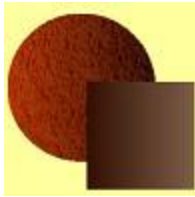
Many of the early issues surrounding agile have been addressed sufficiently well that agile is good to go in large scale organizations with very large scale acquisition practices, like the U.S. DoD. Primarily, the target systems are business systems; but there is applicability to all software as the department and federal agencies strive to meet the challenge laid out by Secretary Gates in 2008.

John Goodpasture

Orlando,

August, 2015

guide-tailoring-dod-it-acquisition-program



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Agile and the U.S. Department of Defense

Agile methods have a useful but limited role in Defense programs, providing quick-reaction capability, effective methodology for many Web applications, and a source of potential innovation for Defense needs.



The primary objective of Defense acquisition is to acquire quality products that satisfy user needs with measurable improvements to mission capability and operational support, in a timely manner, and at a fair and reasonable price.

“Introduction to Defense Acquisition Management”¹

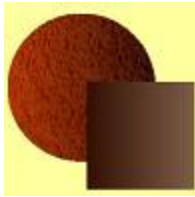
There is certainly no conflict between agile methods and the primary objective of Defense acquisition, as given in the opening quotation. Customer value, timeliness, and investor satisfaction, albeit in a government context, are all there.

There is no lack of adoption: just search the archives at the Air Force Software Technical Support Center’s publication *“Crosstalk – The Journal of Defense Software Engineering”* for any number of ‘agile’ words and you will find well more than a hundred articles in the return, many citing successful case studies.²

In fact, within the strictures for Defense acquisition, there is an acquisition process called ‘evolutionary acquisition’ that embraces many agile values and principles.³ And like all large enterprises, software intensive projects in the Department of Defense range from relatively simple Web functionalities for the agencies and services all the way to mission critical and life critical applications and systems for the warfighter. Consequently, a range of project capabilities is applicable, including agile, according to needs and requirements.⁴

Large scale acquisition programs⁵ for the U.S. Department of Defense, DoD are perhaps the pinnacle of formal process and high ceremony. To be sure, DoD is not alone with programs of grand scale, leading edge technology, and complexity that stretches the imagination.

Look for examples in the space programs of the various space-faring nations; construction projects of complex buildings and infrastructure world-wide; nuclear, conventional, and alternative energy projects of all kinds; advanced physics and material sciences; bio-engineering; and many others. However, the long-standing and well documented methodologies and practices of the DoD are an excellent example of formality and doctrine applied to programs and projects. Therefore, for the purposes of this book, we will use the DoD as our



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surrogate for high-ceremony methodology on an enterprise scale.

Free information on DoD values, principles, and practices is available from the Defense Acquisition University⁶, and various Defense documents in the public domain, starting with these two:

—Directive 5000.01, “*The Defense Acquisition System*”, that establishes the Defense acquisition system, and

—Instruction 5000.02, “*Operation of the Defense Acquisition System*” that gives operating instructions and guidance.

	Agile and the military
<p>A project management tip</p>	<ul style="list-style-type: none"> • XP depends on discipline, something the military is quite good at. • SCRUM envisions a product master, a role provided by the acquisition agencies • EVO envisions incremental and evolutionary deliveries from a string of short waterfalls, almost identical in description to the ‘evolutionary development’ in the DoD instructions • Crystal envisions harnessing the ingenuity of individuals adapting to situations; small units in DoD are trained to act on their own recognition.

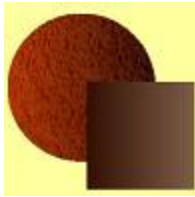
Slicing and dicing finds the agile spot

As in most businesses, projects in DoD come in all sizes. The business case for a defense acquisition determines the Acquisition Category, ACAT, within which the program lies. ACATs number I to IV, and are largely defined by dollars and milestone decision authority with ACAT I being the category for the largest programs.⁷

Within DoD, programs are classified in a number of different ways; one way is by technology content. Software is one of those technologies – ‘software intensive’ systems are those for which the dominant technology is software. ‘Software intensive’ is further classified by application and domain: Automated Information Systems, AIS, is one of the three general classifications of DoD software intensive systems, primarily for business systems within DoD; AIS ACAT III programs are relatively smaller and less complex defense undertakings that are potential candidates for agile methods.⁸

The other two classifications are Command, Control, Communications, and Intelligence [C3I], and Embedded Systems. The latter are typically found in warfighter systems like avionics, vehicular, man-pack, and ship-borne systems and tend to have critical specifications.

There are other views and classifications sanctioned within DoD. For instance, there are functional and technical domain views, either vertical or horizontal. There are three primary vertical domains: business,



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intelligence, and warfighter.

For example, in business systems, there may be personnel, logistics, and planning systems. In C3I, there may be intelligence, strategic, tactical, and field systems; and in warfighter domains there may be fire control, motion control, and electronic warfare.

In the horizontal domains, there are security and communication protocols, tools and simulators, and user interface systems.

Acquisition managers often look at lifecycle views. There are four acquisition lifecycles at the top level: traditional, top-down sequential with iteration; evolutionary with incremental delivery; spiral; and incremental without evolution. The evolutionary

lifecycle is much like any agile methodology; according to Air Force doctrine⁹ evolutionary development is applicable to projects where:

—Requirements are uncertain and the user needs "... 'early functionality' delivered to refine requirements for subsequent deliveries";

—User needs are uncertain;

—Technical feasibility present high risks; and

— An early IOC¹⁰ is required.

The other three lifecycles have a traditional definition.

The agile spot in DoD

So, putting it all together, agile is a candidate for software intensive, evolutionary programs;

Most likely they are ACAT III, or at the discretion of the Component Acquisition Authority, for funding and decision authority, and

They may be in any of the domains.

Program managers are in the authority chain

In DoD jargon, programs and projects are defined in much the same way as they are in the non-defense literature. Programs are collections of projects, and projects are one-time endeavors to produce a set of outcomes needed by user component.

Acquisitions, programs, and projects are managed activities. The roles are defined in Table 1.¹¹ For agile projects the important thing to take note is that for ACAT III programs, the Component Acquisition Authority has wide latitude, and traditionally delegates all project particulars to the Program Executive Authority, who in turn has latitude to delegate to the program

manager. Many instructions and regulations can be waived by managers at various levels when dollar limits are low and specifications are not critical. Within the space and intelligence community, there is even more latitude given the low volume and one-of-a-kind nature of space and intelligence programs.¹²



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Table 1 DoD Management Roles	
Typical Title	Management duties on DoD programs
Defense Acquisition Executive	<ul style="list-style-type: none"> The defense under-secretary responsible for acquisition for the DoD
Component Acquisition Executive, CAE	<ul style="list-style-type: none"> The service secretaries and defense agency directors The CAE is the ultimate authority within their components for acquisition
Program Executive Officer, PEO	<ul style="list-style-type: none"> A manager with executive authority over multiple programs Typically a general officer or civilian equivalent
Program Manager	<ul style="list-style-type: none"> The manager whose principal duty is gathering and validating end-user needs, developing the investment budget, planning program decision milestones, validating requirements for joint service interoperability, and operations and maintenance [O&M] budgeting and planning
Acquisition Manager	<ul style="list-style-type: none"> The manager whose principal duty is acquiring the product even if the product is produced on a contract. Manage contract requirements and technical management of contracts, other specifications and standards, and overall management of resources allocated from the program to the project. The duties may also include management of key reviews leading to decision milestones.
Project Manager	<ul style="list-style-type: none"> The manager whose principle duty is the day to day management of a project, to include planning, organizing, controlling, and managing earned value from resources committed.

Methodology is flexible within standards

All defense programs follow a prescribed defense acquisition management process. However, according to ACAT and other discretion granted to the Component Acquisition Executive in Instruction 5000.02, the Program Executive Officer and the program manager are empowered to tailor practices for less complexity and quicker life cycle.

One example of discretion is DoD's 'evolutionary acquisition' exceptions already noted. Where it is determined by the CAE or PEO that the underlying technology is mature and available, and there is a recognized need for capability in the shortest

possible time, DoD program managers can 'cut to the chase' and field functionality incrementally and in evolutionary fashion. In these programs, it is recognized up-front that a fully functional capability will come over time. Less than a fully functional



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system is accepted for the benefit of an early deployment of essential feature and function.

There are a very large number of practice standards for every aspect of DoD projects. A generation ago, DoD was its own standards body, writing and publishing a prodigious body of knowledge in the form of instructions, guidelines, military standards, handbooks, and procedures for projects and programs. Since 1994 onward, it has been DoD policy to govern DoD design and implementation practices according to industry standards insofar as possible given the warfighter nature of defense requirements. Seeking to leverage

The Defense acquisition management process

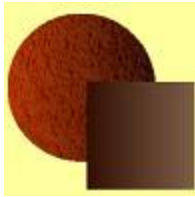
The Defense acquisition management life cycle for the U.S. DoD is given in Figure 1 that is adapted from the “*System Engineering Guide*” of the Department of Defense.

the work of organizations like ISO, IEC, IEEE, and EIA, the DoD has adopted many of their standards as replacements for in-house DoD directives.

An important example is the adoption of ANSI/EIA 748B, Standard for Earned Value Measurement System. Another example: In the national intelligence community policy guidance 105.1 already discussed, there is direction that specifically allows system engineering to follow nationally recognized bodies of knowledge, like that from the Software Engineering Institute and the International Council on System Engineering.¹³

Phases and Gates

Major DoD programs are sequential between major phases; each phase is guarded by a gate with formal criteria and a decision authority empowered to open the gate, or not.



In this simplified diagram, milestones A, B, and C are the gates to the evolving product; PEOs have discretion to collapse the process according to the amount at stake

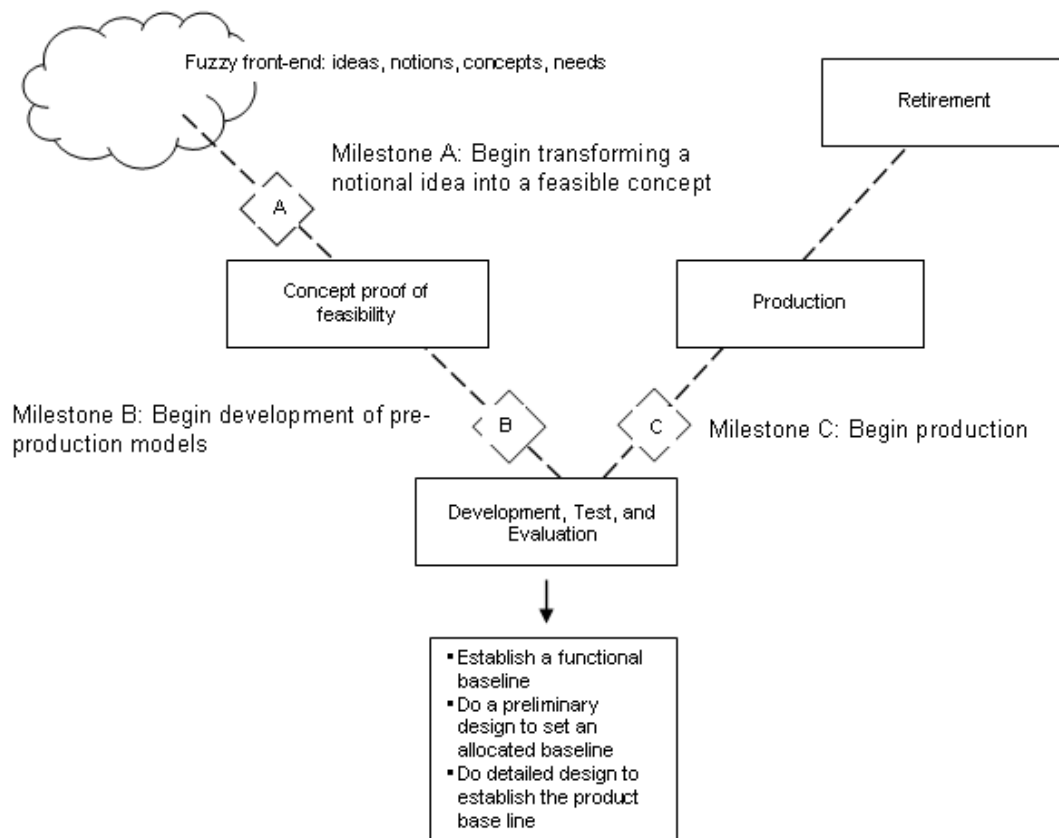


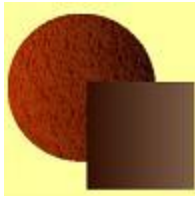
Figure 1, Acquisition Life Cycle

Though not explicit about how much time is apportioned among phases, suffice to say that the phases run sequentially and finish-to-start in precedence based upon the milestone decisions.

Gates, called milestone reviews, control the exit from and entry into phases. Criteria are defined for moving through the gates successfully; program decision points are

events to assess the achievement of the criteria. Decision point reviews are typically pre-requisite to milestone reviews.

All important activities to determine user needs and make an assessment of available technology are outboard of the formally defined phases. These activities have processes all to themselves. These activities in effect develop and obtain approval of the



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business case. Critical success factors are documented. Parallel or enabling technology programs could be started, or synchronized with the program being approved.

In a nod to Mr Royce's ideas and to the ideas of agile and iterative methods, a subset of

customers may get the advantage of an "IOC" model before full scale production of the "FOC" models is made available to all users. IOC is intended to be fully functional but may not be manufacturable in scale. However, like the evolutionary acquisition already discussed, IOC may also be less than fully featured and functional.

Iteration in the DoD model

At the top level as illustrated in Figure 1-5, the DoD model departs from Royce's model insofar as iteration is not planned or encouraged between phases. Once the to double back to an earlier phase.

However, within phases, the Royce model or

Agile requires reconciliation of traditional Defense acquisition practices

For the agile project manager, there are a few key practices in normal Defense programs that require reconciliation with agile methods. Among these are the practices of the customer, contracts, and teams; and the system engineer. Four others are earned value management, independent test verification and validation, configuration management, and data management.

Customers, contracts, and teams

For the most part, DoD end-users are represented by acquisition agencies or training and development components.¹⁴ These agencies and components are the product masters for end-user projects.

Although not an exclusive arrangement, representation rather than direct participation is a fact in many DoD projects. Representation puts distance between developer and user that is not present in most commercial agile projects. Consequently, practices must emerge and evolve to overcome the disadvantages of distance.

Furthermore, the end-user community is quite large, although not as large as the mass software audience for games, social

milestone decision has been made to move onto the next phase, it is not the usual practice

other methodologies could be used according to risk and technology, to include agile methods we discuss in this book.

networking, and home-use applications. So, representation is not only a reality of the DoD structure but it is a reality driven by practicality – there's simply no way for hundreds, perhaps many thousands of users to participate in a single project.

Therefore, practices like customer teams to represent large constituent populations, webinars and webinar demonstrations to disparate user groups, wide-spread 'beta' tests among early adopters, and even collaborative contributions to end-user documentation, not unlike the open community that contributes to Wikipedia, are possible mitigations for distance and dispersion of the real end-users.¹⁵

Another point is that most software is



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acquired by contract from developers and suppliers. Agile methods will more often than not be applied through the channel of a contract, and the contracting officials will not be the end-user or even the end-user's component unit. The contract will represent three points of view: the rules of contract law held by the contracting officer; the project objectives of the project manager; and the functional needs of the end-user. A successful contractor will satisfy all three constituents.

The contracting officer is the only one of the three with the statutory power to commit the government to a contract and authorize acceptance and payment of contractor invoices. In general terms, the contracting officer also controls scope and delivery—that is, insofar as scope and delivery are explicit in the contract, only the contracting officer can change the obligation of the contractor's performance requirement.

DoD is comfortable with teams that are
System Engineering

Just like in any civilian project, DoD projects begin with an idea, a vision, and a need that is validated by a business case. The project then enters the realm of acquisition.

DoD acquisition managers work from the top-level requirements stated by the user components or others responsible for the user's needs, and from requirements derived from the standing instructions and directives of the acquisition system.

System engineering is a mandated discipline in DoD acquisitions as given in Enclosure 12 of 5000.02 – “Systems engineering shall be embedded in program planning and be designed to support the entire acquisition life cycle”. The job of system engineering in DoD is two-fold: specify the architecture

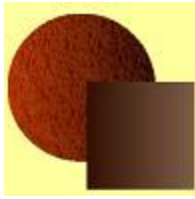
small high performance units with empowering decision authority. That is how the military is built from the smallest unit upward. DoD is comfortable with ‘joint’ operations involving the mix of military and civilian, multiple skills, matrix assignments, and leadership commensurate with the situation.

It reasonable and practical to build joint DoD-supplier teams to perform work orders contracted for agile projects. Typically, the DoD contribution to the team will be end-user representatives; the contractor will provide a workforce and a project manager; the DoD will have a program manager whose responsibilities end at the water's edge of the actual project operation. That is, the DoD program manager will have responsibility for funding, top-level plans, assessment of progress, and functional acceptance of the work product; the DoD project manager will not manage the project day-to-day unless the work is done in-house of the acquisition agency.

and associated requirements to synthesize a system design; and specify the acceptance criteria and means to verify and validate satisfaction of the top-level requirements.¹⁶

The job of system engineering is not threatened by agile methods, but responsibilities are different. Agile does not embrace a ‘big design up front’ where system engineers typically do most of their work. System engineering in the agile space provides ‘just enough’ architecture and system design to provide guidance for each planning wave and direction for each iteration to begin work.

Assuming agile projects will be conforming to evolutionary acquisition, and likely will be small endeavors well within the discretion of PEOs and program managers,



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the system engineer has the additional responsibility of reconciling evolutionary requirements with the overall vision and guiding architecture. These responsibilities are explicated recognized in Chapter 3 of the DoD “*Systems Engineering Fundamentals*” guidebook.

Contractors working on agile DoD projects may provide systems engineering, or the government may provide the engineering talent. In any event, following the dictum

Earned Value Management and the IMS/IMP

DoD policy requires earned value management on programs valued at \$20M or greater. EIA 748 is the directed standard. There are means to incorporate earned value measurements in agile methods, even for the smallest program. In point of fact, earning value is valuable regardless of the amount at stake.

An Integrated Master Plan, IMP, is required on programs that require earned value measurement. The IMP is event based; it is intended to forecast accomplishments to be expected at events. In the agile space, appropriate events are releases. A master schedule complements the IMP.

An Integrated Master Schedule, IMS, is required on all programs that have earned

Independent Test and Verification

Development, test, and evaluation [DT&E] is mandated by 5000.02 Enclosure 6. However, there is wide latitude granted the program manager: “The PM shall design DT&E objectives appropriate to each phase and milestone of an acquisition program.”

Agile methods embrace test as integral to the design and development process. The question arises about a Taylor-Deming view of test – to what degree should testing be

that every system or product has architecture, a systems model is needed just like it is for any other agile project.

However, agile does not require detailed requirements from the architect at the outset since details are developed during each iteration. A persistent means to record requirements is required for support and follow-on to so-called pre-planned product improvements, P3I.

value measurement systems. As described in Data Item Description 81650, an IMS is a network schedule that conforms to an ‘activity on node’ paradigm; it shows a critical path and all the dependencies among activities. And, 81650 requires risk adjustment of schedules, embracing the 3-point estimating procedure used widely in project estimating.

Agile teams’ dependencies can easily be rendered in a network schedule. Activities within a team are not ordinarily scheduled formally since a team completes its work in a matter of a few weeks; however, there is nothing to preclude identification of key activities and scheduling their interdependencies within the team complement.

independent of the developers and outside the project performance team? Certainly independent validation where users actually employ the deliverables operationally, or in an operational test setting, is probably without question. Generally speaking, in this book we endorse independent acceptance testing to verify before validation that the product works. See Figure 2-2 for our ‘V’ diagram. All other testing is appropriately within the agile high



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performance team.

Configuration and Data Management

Configuration management is a component of system engineering in the DoD world. As given in 5000.02 Enclosure 12 for Systems Engineering, the management team will "... use a configuration management approach to establish and control product attributes and the technical baseline across the total system life cycle." This is a matter of establishing permanence and change control over the product baseline. No less is expected in commercial projects where product baseline control is carefully exercised.

Data management extends to the broader topic of information management. Unlike commercial agile projects where common practice is whiteboards, CRC cards, user stories on 3x5s, and etc, projects in the public domain must have permanent records

that can be examined and evaluated by constituents. There are also issues of data rights and ownership of intellectual property by the myriad participants in a DoD project.

Again, Enclosure 12 comes into play: Enclosure 12 makes data management a system engineering responsibility. It is incumbent on the program manager and the system engineer to establish a 'data management strategy' consistent with the project's agility, long-term P3I possibilities, and the needs of the user community.

Each situation will be different; the latitude afforded program managers on smaller scale projects is the key to effective strategy for the performance teams and the project beneficiaries.

Summary and Take-Away Points

- Our theme is agile methods have a useful but limited role in Defense programs, providing quick-reaction capability, effective methodology for many Web applications, and a source of potential innovation for Defense needs.
- Right from the top evolutionary and incremental methods are encouraged by DoD to solve a number of acquisition needs.
- Acquisition officials, right down to the program manager, are afforded much latitude to get the job done. Adoption has begun within many software intensive systems in all domains.
- However, there are limitations: mission and life critical needs, certain high security needs, and programs on the scale that is routine in the DoD are not appropriate to agile methods because there is insufficient rigor and scalability to the practices.
- System engineering, with its included tasks of test, data management, and configuration management, is an important skill to have on the agile project. System engineering brings thoughtful architecture that in the end will pay lifecycle benefits.
- In the main, DoD will benefit from agile methods applied with discretion and thoughtfulness because agile projects are inherently timely and cost effective.



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End notes

1 Editors, *“Introduction to Defense Acquisition Management”* Defense Acquisition University Press, Fort Belvoir, VA, December 2008, pg 1

2 <http://www.stsc.hill.af.mil/crosstalk/2009/07/index.html>

3 USD(AT &L) *“DoD Instruction 5000.02, Operation of the Defense Acquisition System”* U.S. Department of Defense, 8 December 2008, pg 13

Retrieved from <https://acc.dau.mil/dag500002>, August 2009

4 At the present time, the only agile method formally recognized in the Defense Acquisition Guidelines, DAG, is the evolutionary acquisition process. However in the Air Force guidelines for system acquisition, Extreme Programming is a recognized design method. According to the Air Force view, waterfall, incremental, evolutionary, and spiral are the four principal lifecycles.

See Editors, *“Guidelines for Successful Acquisition and Management of Software Intensive Systems: Weapons Systems, Command and Control Systems, Management Information Systems”*, Software Technical Support Center, U.S. Department of the Air Force, February, 2003, Chapter 2 pg 4-13; Chapter 15 pg. 7

5 DoD makes a distinction between acquisition and procurement, the latter being for non-developmental items such as parts and supplies and services. Acquisition includes design, engineering, test and evaluation, production, and operations and support of defense systems.

6 See the web link at <http://www.dau.mil/pubs/gdbks/idam.asp>

7 There are distinctions between automated information systems, AIS, defense space systems, and all other programs insofar as ACATs are concerned. AIS only uses ACAT I and III, wherein AIS ACAT III is defined simply as not meeting the requirements for ACAT I. Defense space systems are exempt from DoD instruction 5000.2 that governs defense acquisition, but there are parallel instructions for space systems that recognize the low volume but high complexity of space systems. As regards ACAT IV, only the Navy and Marine Corps have ACAT IV programs. See *“Introduction to Defense Acquisition Management”* op. cit. ppg 20-23

8 ACAT III AIS programs are budgeted for less than \$126M acquisition cost, with not more than \$32M in any fiscal year, all in FY2000 constant dollars; subject to change with each session of Congress.

See *“DoD Instruction 5000.02, Operation of the Defense Acquisition System”* op. cit., Enclosure 3, pg 33

See *“Guidelines for Successful Acquisition and Management of Software Intensive Systems: Weapons Systems, Command and Control Systems, Management Information Systems”*, op. cit., Chapter 2 pg 10

10 'IOC' and 'FOC' refer to initial and final operating capability. IOC specifically means that a subset of the total user population has been given the use of the deliverable

11 *“Introduction to Defense Acquisition Management”* op. cit. pg 25

12 “A key challenge for the Milestone Decision Authority is ensure a balance between the agility and discipline of the acquisition process” is guidance given in *“Intelligence Community Policy Guidance – Acquisition, 105.1”* (Unclassified) 12 July 2007, paragraph G.3, authorized by the



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Deputy Director for National Intelligence for Policy, Plans, and Requirements

13 “*Intelligence Community Policy Guidance – Acquisition, 105.1*” op. cit. paragraph N

14 ‘Components’ is DoD jargon for the various organizations within the Department of Defense. To be a component does not strictly imply a place in the hierarchy, but generally components are very high-level, to include each service and major command, other field units, and the Defense agencies, and organizational units under the Secretary of Defense and the Joint Chiefs of Staff. See “*DoD Instruction 5000.02, Operation of the Defense Acquisition System*” op. cit. paragraph 2.A. for details.

15 In 2009, the Army began collaboration among users to write and edit Army field manuals, using techniques something like Wikipedia collaboration. Users make contributions to established field manuals, but then editors and review boards validate content. See:

Cohen, N. “*Care to write Army doctrine? With ID, Log on*” The New York Times, August 13, 2009, retrieved from <http://www.nytimes.com/2009/08/14/business/14army.html?scp=5&sq=wikipedia&st=cse> August, 2009

16 A good reference for system engineering in the DoD is:

Editors, “*Systems Engineering Fundamentals*” Systems Management College, Defense Acquisition Press, January 2001, Chapter 3, pg 31-33



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About the author

John C. Goodpasture, PMP is a program manager, instructor, author, and project consultant specializing in technology projects

For many years, he has been one of the instructors for an online distance learning course in Agile project management. He was project director of an E-Business application development unit at Lanier Professional Services where his team delivered a number of successful projects using agile principles and practices.

He is the author and contributing of four other technical books in project management, numerous magazine and web journal articles in the field of project management, and has been an invited speaker at many professional project management events.

After graduating with a master's degree in engineering, John was a system engineer and program manager in the U.S. Department of Defense leading high technology programs. Subsequently, he managed numerous defense software programs while at Harris Corporation in Melbourne, FL., eventually finishing his corporate career as operations vice president for a document imaging and storage company.

He has coached many technology teams in new product development and functional process improvement, both in the United States and abroad, in industries as diverse as semi-conductor manufacturing and retail mortgages.

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