Why Agile?

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Why Agile?

First…

A Working Definition of Agile

"Agile An *iterative* and *incremental* (evolutionary) approach to software development which is performed in a *highly collaborative manner* by *self-organizing teams* within an *effective governance framework* with *"just enough" ceremony* that produces *high quality software (systems)* in a *cost effective and timely* manner which *meets the changing needs of its stakeholders*.

Source: Ambler, Scott. *Disciplined Agile Software Development: Definition*, 2013
http://www.agilemodeling.com/essays/agileSoftwareDevelopment.htm

Why Agile?

Current Method (AKA waterfall) Is Not And Has Not Been Effective!

"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"
— **Robert Gates, United States Secretary of Defense**, September 2008 speech

"These (capability) advances, coupled with our adversaries' commitment to a demonstrated pace of prototyping and experimentation and fielding, that, at present, far outstrips our own pace, present a formidable challenge to U.S. forces operating around the globe,"
—**Michael D. Griffin, Under Secretary of Defense for Research and Engineering,** April 2018, Promoting DoD's Culture of Innovation

*"*Simply delivering what was initially required on cost and schedule can lead to failure in achieving our evolving national security mission — the reason defense acquisition exists in the first place."
—**Frank Kendall, Under Secretary of Defense,** 2015 Performance of The Defense Acquisition System

Phase gates often give programs *"False Positive Feasibility" or* the illusion of knowing all the requirements, design and architecture very early on in the program. *"There was in fact no correlation between exiting phase gates on time and project success… the data suggested the inverse might be true."* **—Lean Machine**

Why Agile?

Congress Mandates Reform

NDAA 2018 Section 873
PILOT PROGRAM TO USE AGILE OR ITERATIVE DEVELOPMENT METHODS TO TAILOR MAJOR SOFTWARE-INTENSIVE WARFIGHTING SYSTEMS AND DEFENSE BUSINESS SYSTEMS.

NDAA 2018 Section 874
SOFTWARE DEVELOPMENT PILOT PROGRAM USING AGILE BEST PRACTICES

NDAA 2018 Section 891
TRAINING ON AGILE OR ITERATIVE DEVELOPMENT METHODS.
…establish a training course at the Defense Acquisition University (DAU) on agile or iterative development methods

NDAA 2019 Section 1643
ACCELERATION OF GROUND-BASED STRATEGIC DETERRENT PROGRAM AND LONG-RANGE STANDOFF WEAPON PROGRAM
… leveraging agile software development or other innovative approaches to reduce time frames for software development

Why Agile?

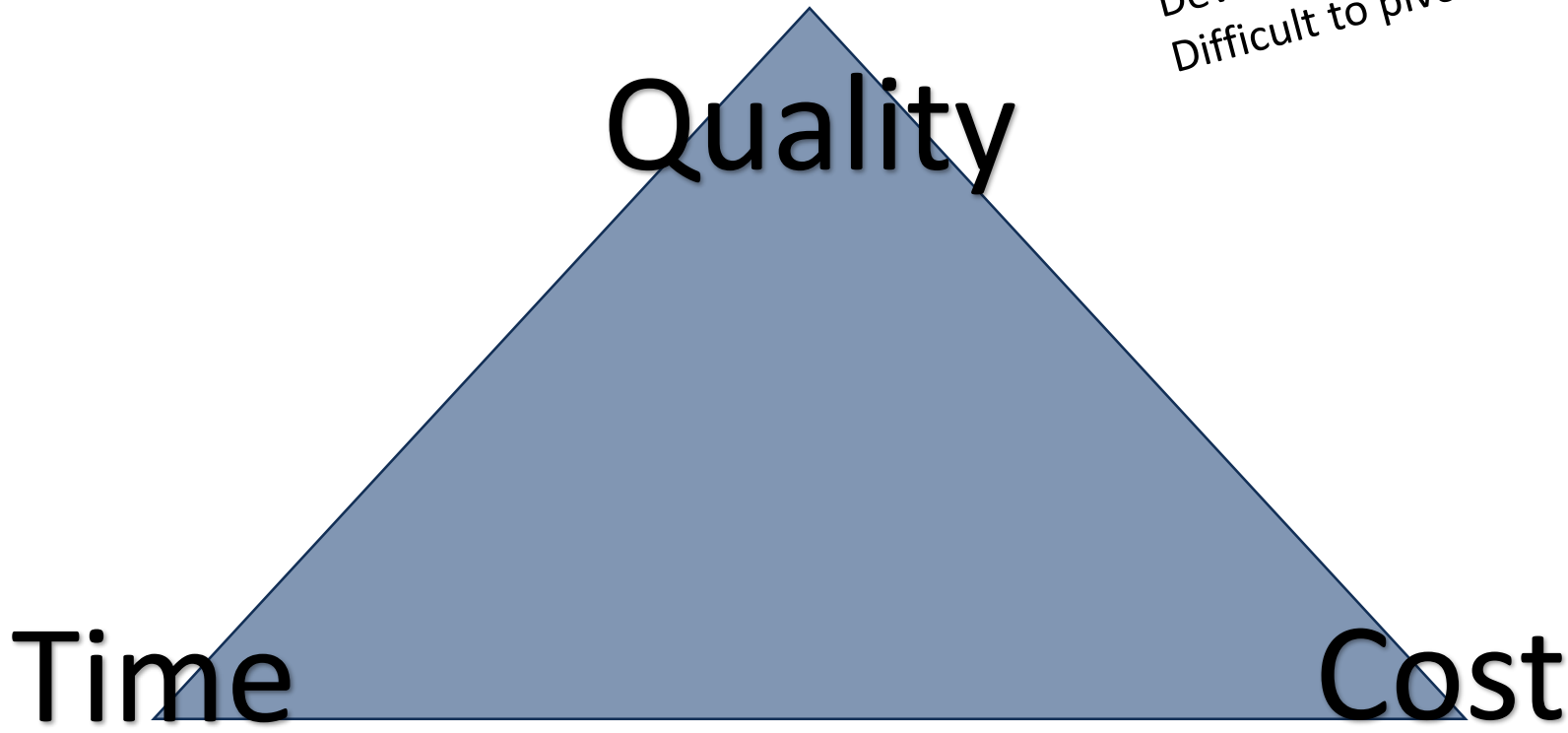
The Iron Triangle is broken!

No longer is it Time, Quality and cost, Pick any two

We need all three!

Characterized by

Zero Sum among Time, Quality and Cost
Scarcity Mindset
To improve one of the 3, others must suffer
Development of a single, point solution
Difficult to pivot



Why Agile?

We want it all…

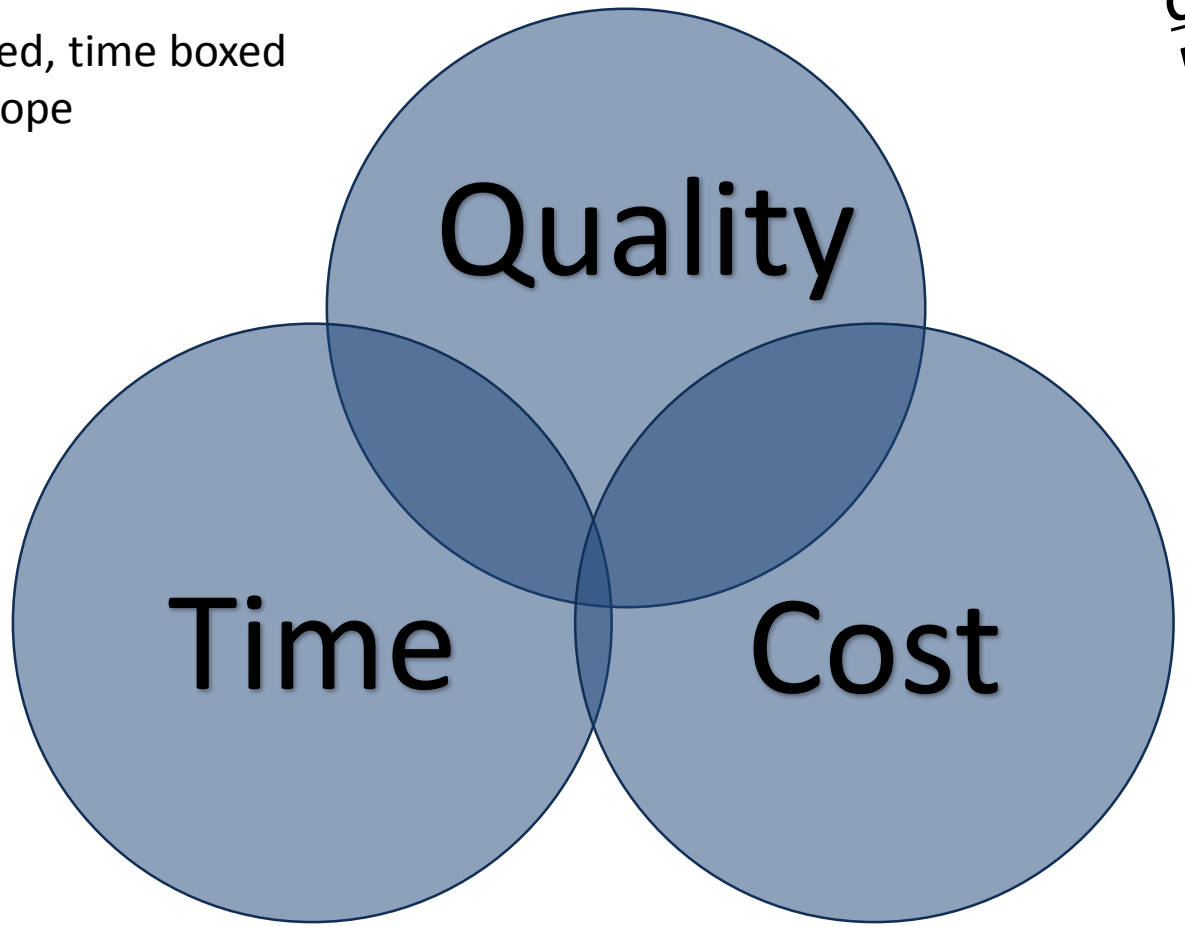
- Improve Quality
- Lower Cost
- Increase Delivery Tempo
  (Industry: Improved Time to Market vs DOD: Improved Concept to Warfighter Capabilities)
- Improve ROI as perceived by the customer and user
- Measure progress and get feedback with demonstration of working system
- Exploit frequent learning opportunities
- Apply lessons learned early and often
- Pivot without mercy
- Use a proven approach
- Reduce time to field
- Align customer/stakeholder/user needs with product delivered

Why Agile?

High Quality, Lower Cost and Increase Delivery Tempo…

How?

- Optimize for regular, prioritized, time boxed deliveries while moderating scope



Characterized by

Frequent Integration
Frequent Demonstration
Deploy on Demand
Fast Fail Learning
Win-Win-Win among Quality, Time and Cost
Abundance mindset
Prioritized Small Batch Delivery
Work in Progress Management

Why Agile?

Solve the "Right" problem

Traditional approach can work well for:

- Programs with stable requirements and environment, with known solutions to the requirements
- Programs with a homogeneous set of stakeholders who communicate well via documents
- Programs for which the technology base is evolving slowly (technology is not expected to be refreshed/replaced within the timeframe of the initial development)

Agile approach can work well for:

- Programs with volatile requirements and environment
- Programs where solutions are sufficiently unknown that significant experimentation is likely to be needed
- Programs for which the technology base is evolving rapidly
- ***Programs with stakeholders who can engage with developers in ongoing, close collaboration*** (Attribute that most often causes problems)

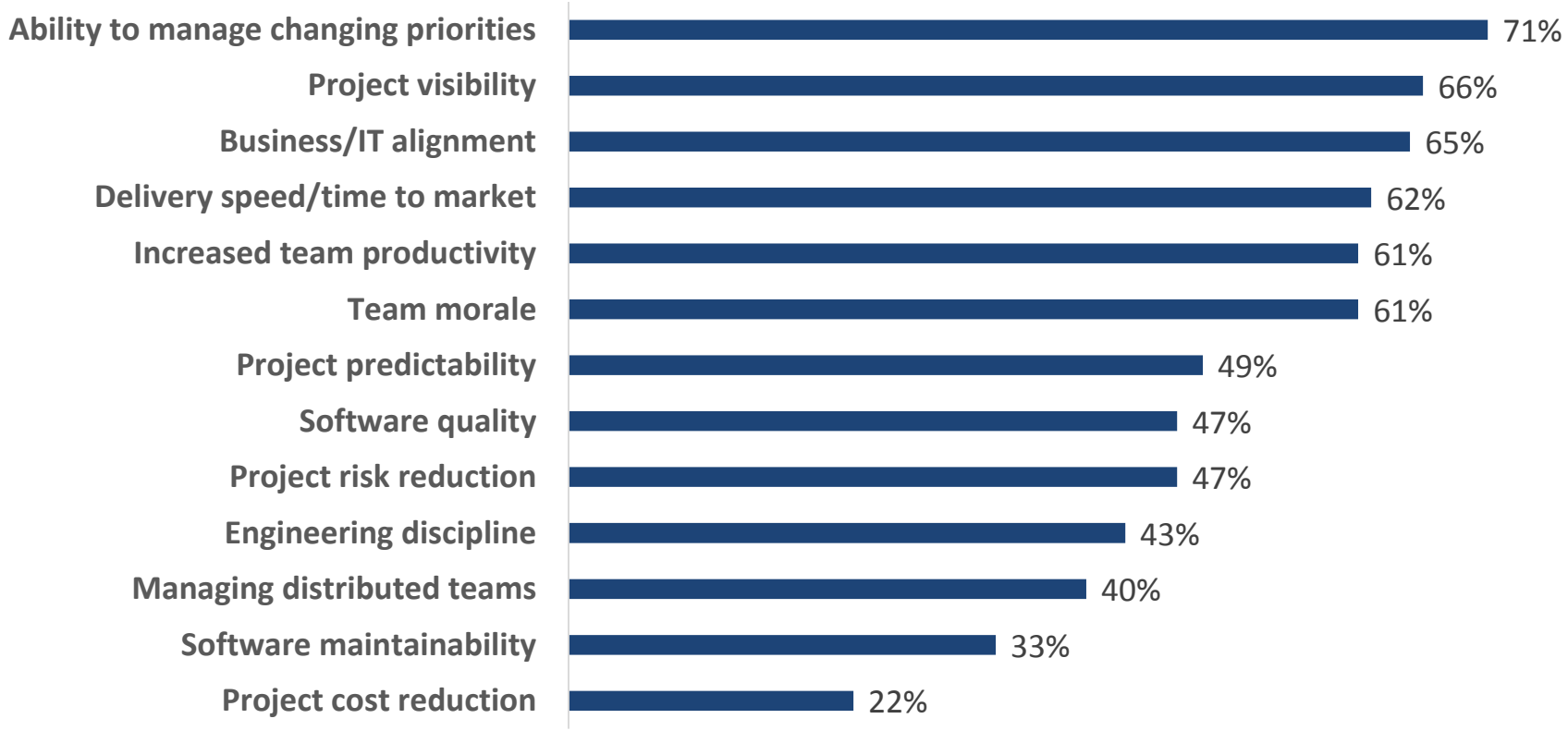
Nidiffer, K. Miller, S. & Carney, D. *Potential Use of Agile Methods in Selected DoD Acquisitions: Requirements Development and Management* (CMU/SEI-2013-TN-0006), September 2013.
https://resources.sei.cmu.edu/asset_files/TechnicalNote/2014_004_001_89166.pdf

Why Agile?
Evolving Workforce

Workforce contractors' employees are rapidly moving towards Agile. Going forward, it will become more and more difficult to staff programs with Waterfall expertise.

Why Agile?

Benefits of Agile Reported In Industry



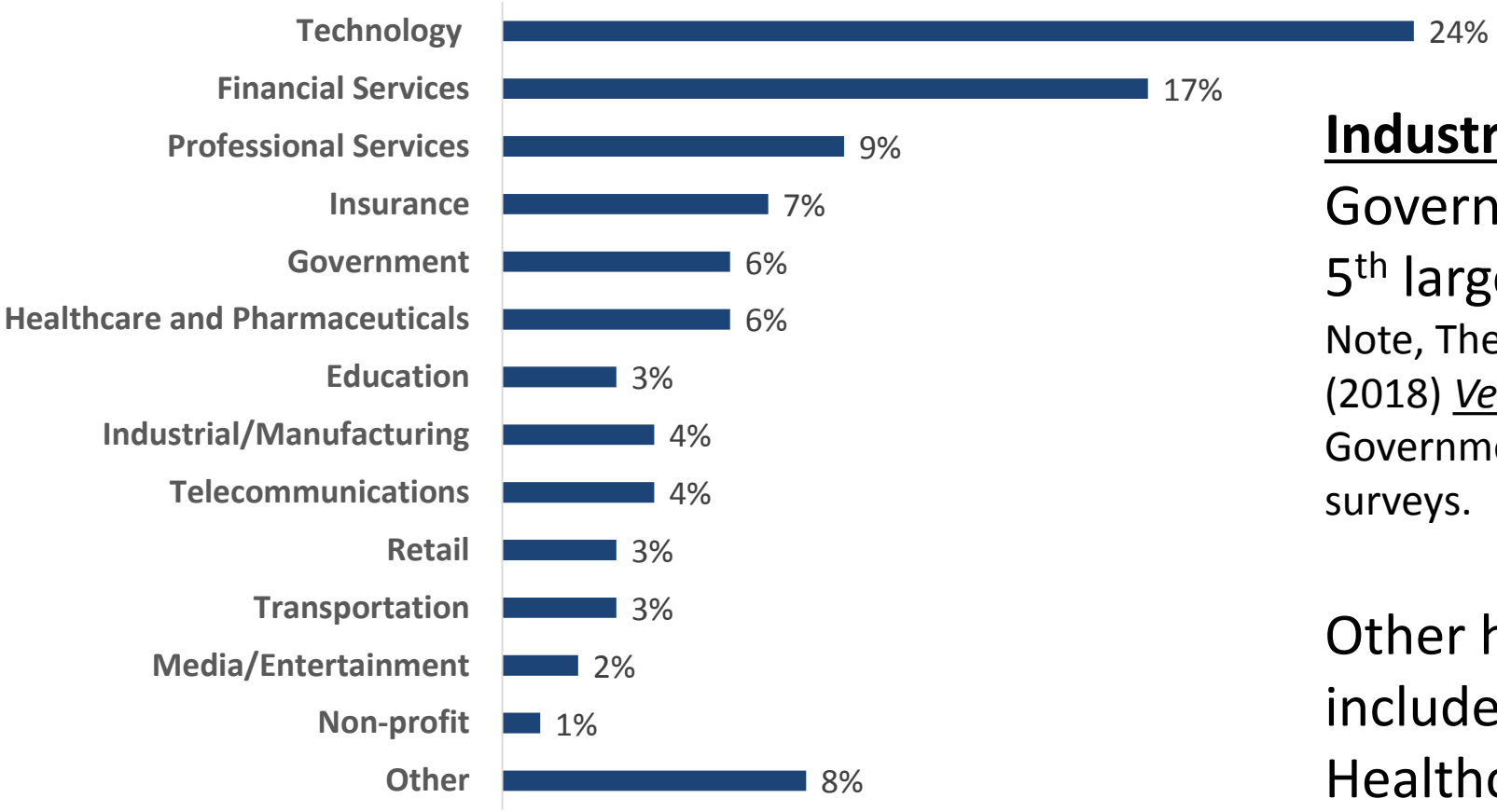
By implementing agile, respondents cited seeing improvements in these areas

*Respondents were able to make multiple selections

Source: Adapted from Version 1, *The 12th Annual State Of Agile Report,* April 2018, https://explore.versionone.com/state-of-agile/versionone-12th-annual-state-of-agile-report

Why Agile?

Diverse Industrial Sectors Report Using Agile



Industry Observations

Government is now included as the 5th largest sector.

Note, These results are from the 12th annual (2018) *Version 1 State of Agile Report*. The Government sector did not make the list in past surveys.

Other highly regulated industries are included such as Financial Services, Healthcare and Energy.

Source: Adapted from Version 1, *The 12th Annual State Of Agile Report,* April 2018, https://explore.versionone.com/state-of-agile/versionone-12th-annual-state-of-agile-report

Why Agile?
Recommendations for Leadership

Provide Visible Leadership Support for Agile – Shape Culture

– Warfighters require more speed and agility – convey the WHY
– Champion new methods, acceptance of risks, program use metrics

Champion Agile Training and Education Across Stakeholders

– From PMOs to Acquisition Executives
– Encourage discussion of methods, challenges, success, resources

Develop Functional Agile Adoption Tiger Teams

– Contracting, requirements, systems engineering, test, PM, etc.
– Work w/process owners to address roadblocks, define new solutions

Replicate Success

– Compile success stories from and recognize early Agile adopters
– Identify root causes of what worked and share across enterprise`

Source: Adapted *From SEI and Mitre briefing to General E. Pawlikowski, April 8, 2016*

Why Agile?

Cheat Sheet of Agile/Lean "Facts"

Agile is….a philosophy, a set of tenets and principles that support multiple implementation methods/approaches

Agile is not …a single set of practices applied in a "one size fits all" way

The most adopted set of Agile practices for small (mostly software) teams is…. **Scrum**

The most adopted set of Agile/lean practices for larger system developments is…. **SAFe (Scaled Agile Framework)**

The most adopted scaling framework by DoD contractors is…. **SAFe**

SAFe is… **lean engineering philosophy and approach** coming from the top of the enterprise **meets Agile approaches** from the team level of the enterprise.

The most cited factor in failure of Agile adoption (regardless of government/commercial) is … **culture mismatch**

Technology adoption approaches **in common with adoption of other types of practices** apply well in Agile adoption settings

Agile engineering practices inside a waterfall acquisition environment cause multiple, serious challenges

Why Agile?

Key Agile 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