



Agile Acquisition

“Creating an Effective Agile Acquisition
Ecosystem”
(Part 1- Contracting)

Makoto P. Braxton

Matthew R. Kennedy, PhD



Disclaimer

- The view, opinions, and/or findings contained in this material are those of the author(s) and should not be construed as an official Government position, policy, or decision, unless designated by other documentation
- References herein to any specific commercial product, process, or service by trade name, trade mark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring
- This material is furnished on an "as-is" basis. The author makes no warranties of any kind, either expressed or implied, as to any matter including, but not limited to, warranty of fitness for purpose or merchantability, exclusivity, or results obtained from use of the material



Overview

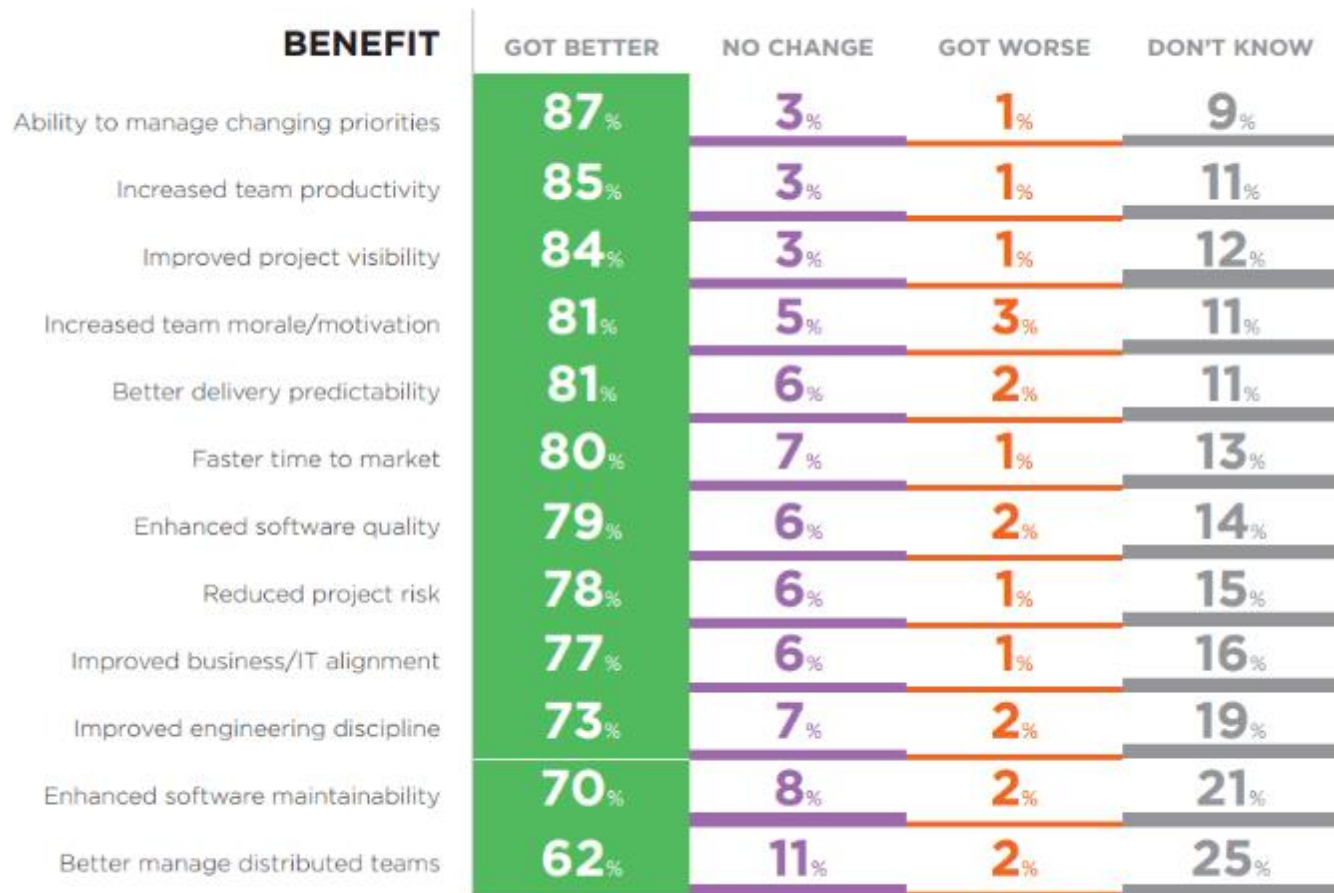
- Agile Overview
- Agile Acquisition Overview
- Agile Ecosystem
- Example Agile Acquisition Ecosystem (Contracting)
- Measuring Value

A stylized, wavy graphic of the American flag, showing the stars and stripes in a flowing, ribbon-like manner. It serves as a background for the title text.

Agile Overview

Benefits of Agile

The top three benefits of adopting agile have remained steady for the past five years: manage changing priorities (87%), team productivity (85%), and project visibility (84%).



*Respondents were able to make multiple selections.



Agile Manifesto

- The foundational document for Agile software development
- Signed by 17 software developers in Feb 2001
- Core Values
 - Individuals and interactions over processes and tools
 - Working software over comprehensive documentation
 - Customer collaboration over contract negotiation
 - Responding to change over following a plan

Principles behind the Agile Manifesto

We follow these principles:

Our highest priority is to satisfy the customer through early and continuous delivery of valuable software.

Welcome changing requirements, even late in development. Agile processes harness change for the customer's competitive advantage.

Deliver working software frequently, from a couple of weeks to a couple of months, with a preference to the shorter timescale.

Business people and developers must work together daily throughout the project.

Build projects around motivated individuals. Give them the environment and support they need, and trust them to get the job done.

The most efficient and effective method of conveying information to and within a development team is face-to-face conversation.

Working software is the primary measure of progress.

Agile processes promote sustainable development. The sponsors, developers, and users should be able to maintain a constant pace indefinitely.

Continuous attention to technical excellence and good design enhances agility.

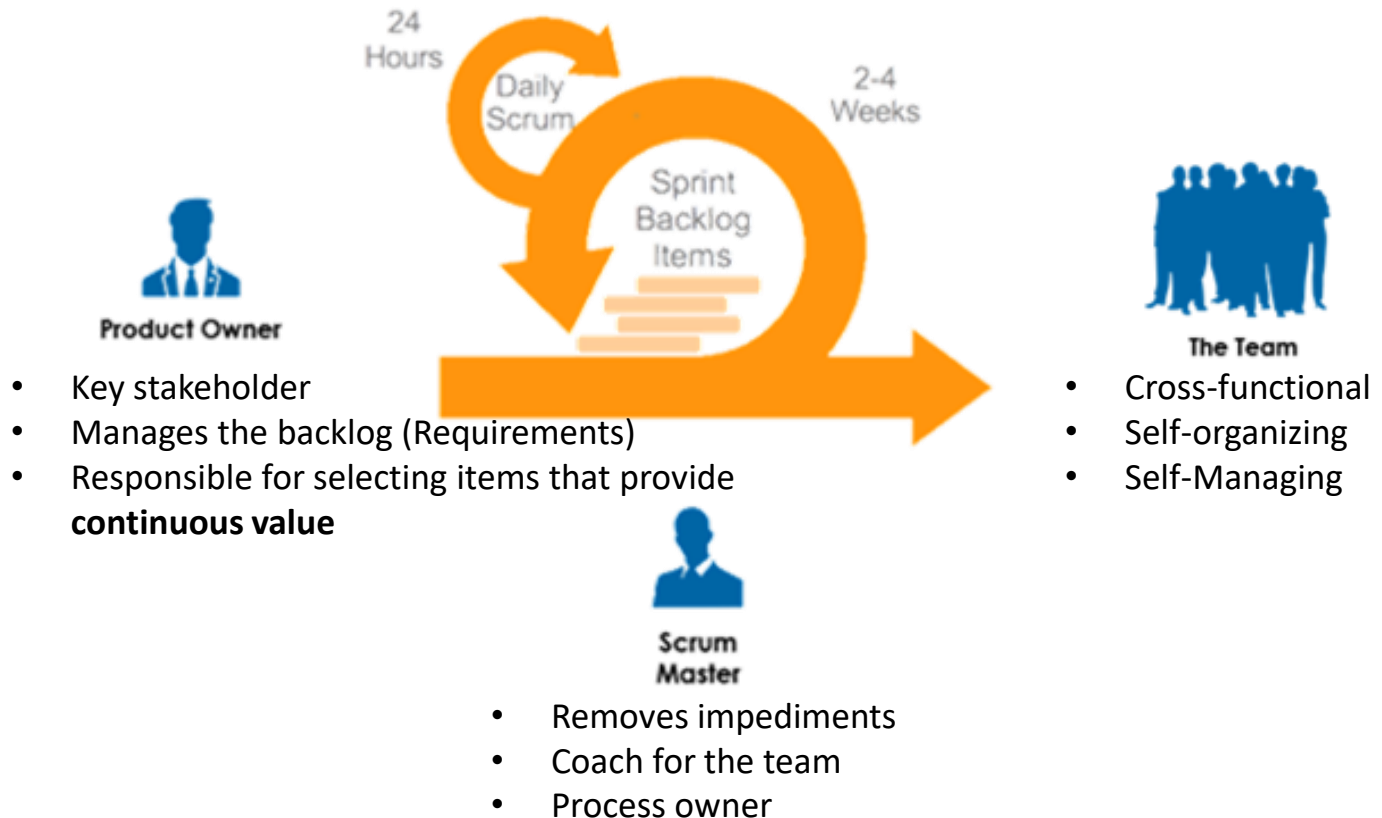
Simplicity--the art of maximizing the amount of work not done--is essential.

The best architectures, requirements, and designs emerge from self-organizing teams.

At regular intervals, the team reflects on how to become more effective, then tunes and adjusts its behavior accordingly.

Scrum

- SCRUM is a proven framework for delivering value using agile methods and practices
- It also provides actionable, artifacts, roles, and activities which can be measured and analyzed



A faded, wavy graphic of the American flag serves as a background for the text. The stars and stripes are visible but light and blurry, creating a subtle patriotic backdrop.

Agile Acquisition Overview



Agile Acquisition Definition

- The term “agile acquisition” means acquisition using agile or iterative development
 - *Acquisition pursuant to a method for delivering multiple, rapid, incremental capabilities to the user for operational use, evaluation, and feedback not exclusively linked to any single, proprietary method or process; and*
 - *Involves—*
 - (A) *the incremental development and fielding of capabilities, commonly called “spirals”, “spins”, or “sprints”, which can be measured in a few weeks or months; and*
 - (B) *continuous participation and collaboration by users, testers, and requirements authorities.*

- NDAA 2018, SEC. 874.

Agile Acquisition Definition (Abridged)

- *Deliver rapid iterative and incremental **value** based on continual user feedback*

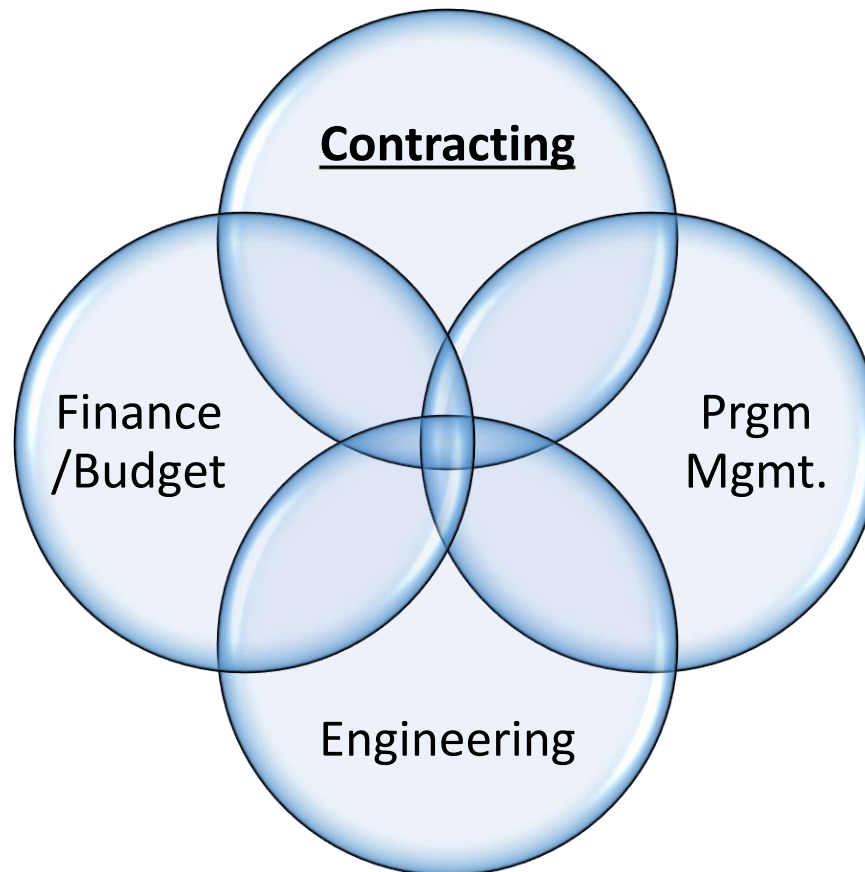


A faded, wavy graphic of the United States flag, showing the stars and stripes, serves as a background for the text.

Agile Ecosystem

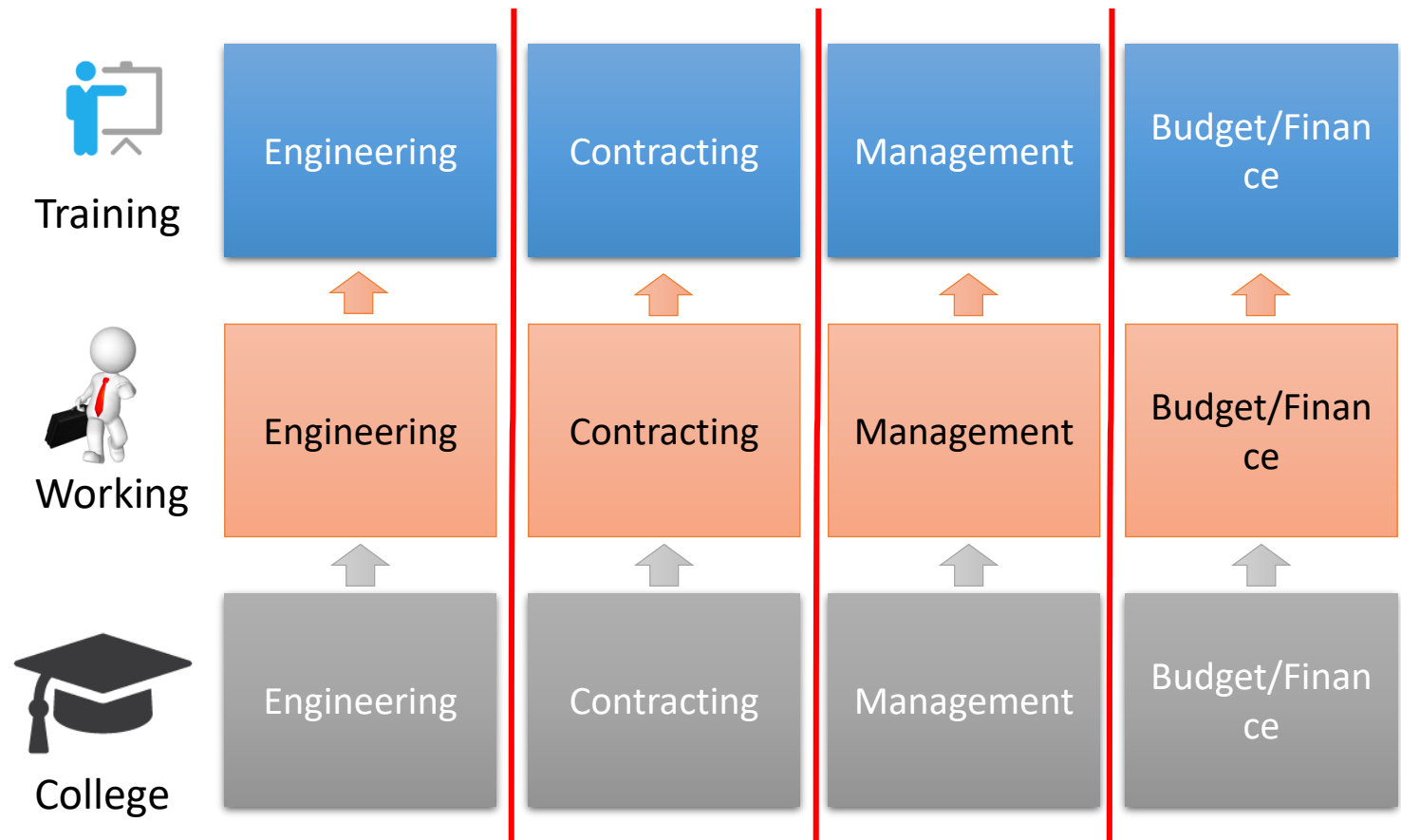
Acquisition Ecosystem

- A connection of functional units* that interact as a system to **deliver value**



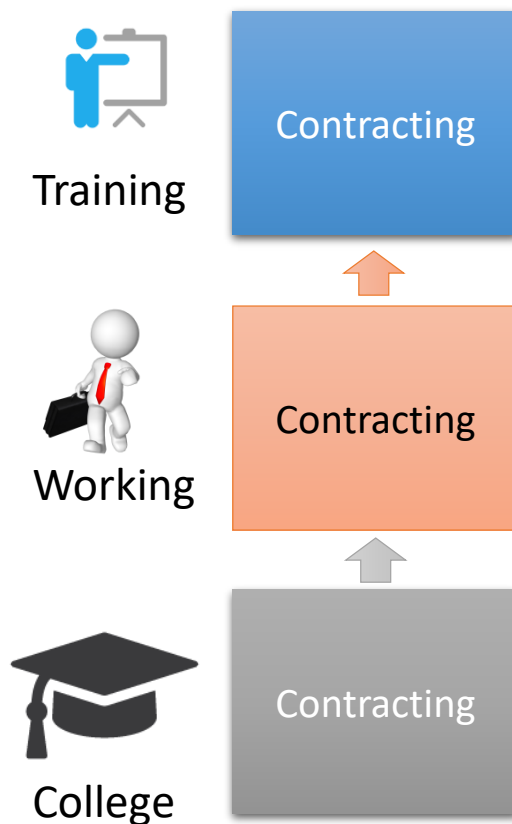
*The functional units may vary based on the environment.

Growth of the Traditional Culture



— Information Barrier

Growth of the Traditional Culture (Contracting)



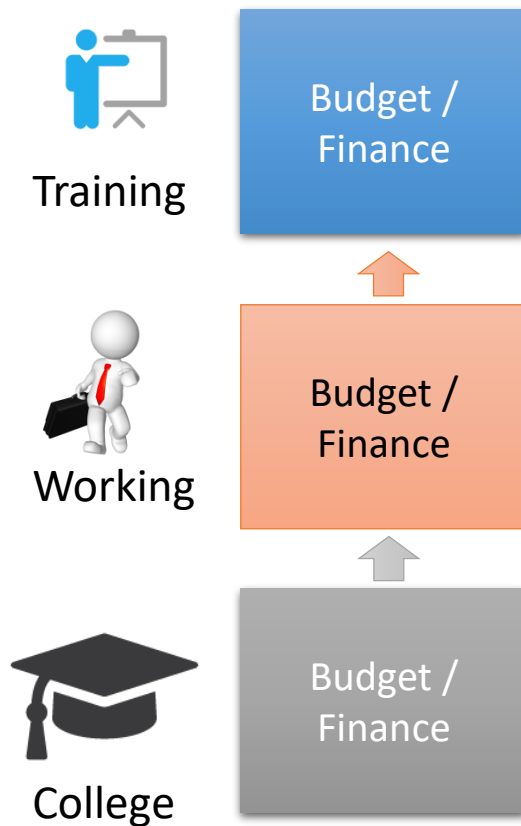
Approach: Contract for concrete deliverables

Success: Delivery of contract requirements

3.2.5.1 Nuts, almonds, shelled. Shelled almond pieces shall be of the small piece size classification and shall be U.S. No. 1 Pieces of the U.S. Standards for Grades of Shelled Almonds. A minimum of 95 percent, by weight, of the pieces shall pass through a 4/16-inch diameter round hole screen and not more than 5 percent, by weight, shall pass through a 2/16-inch diameter round hole screen. The shelled almonds shall be coated with an approved food grade antioxidant and shall be of the latest season's crop.



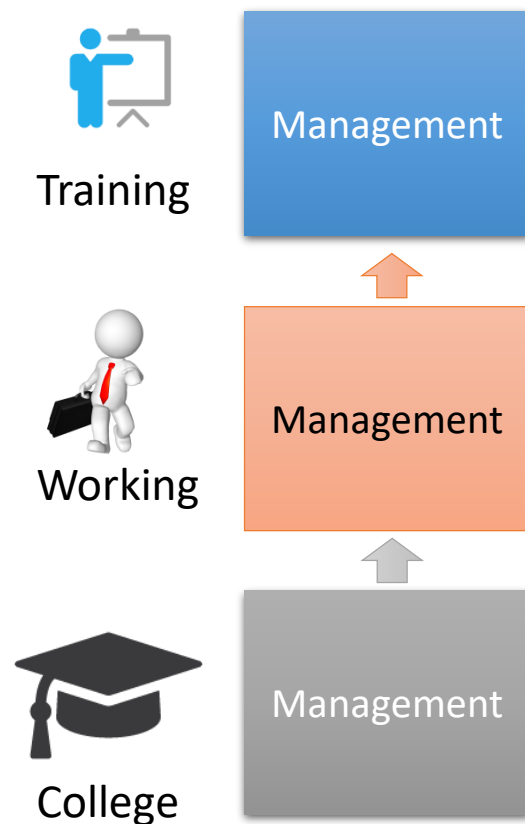
Growth of the Traditional Culture (Budget/Finance)



Approach: Measure Execution Against Plan
Success: Correct Color, Year, Amount (CYA)



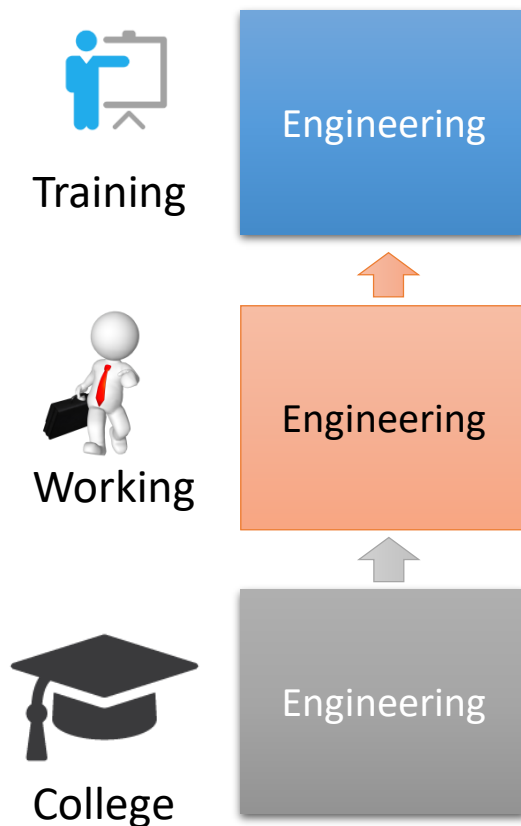
Growth of the Traditional Culture (Management)



Approach: Manage by Phase
Success: Conformance to a Plan

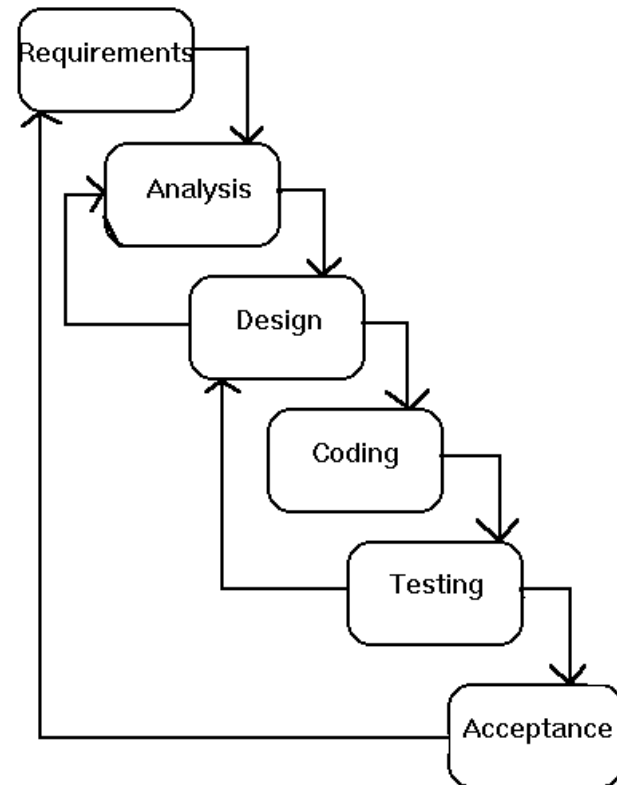


Growth of the Traditional Culture (Engineering)

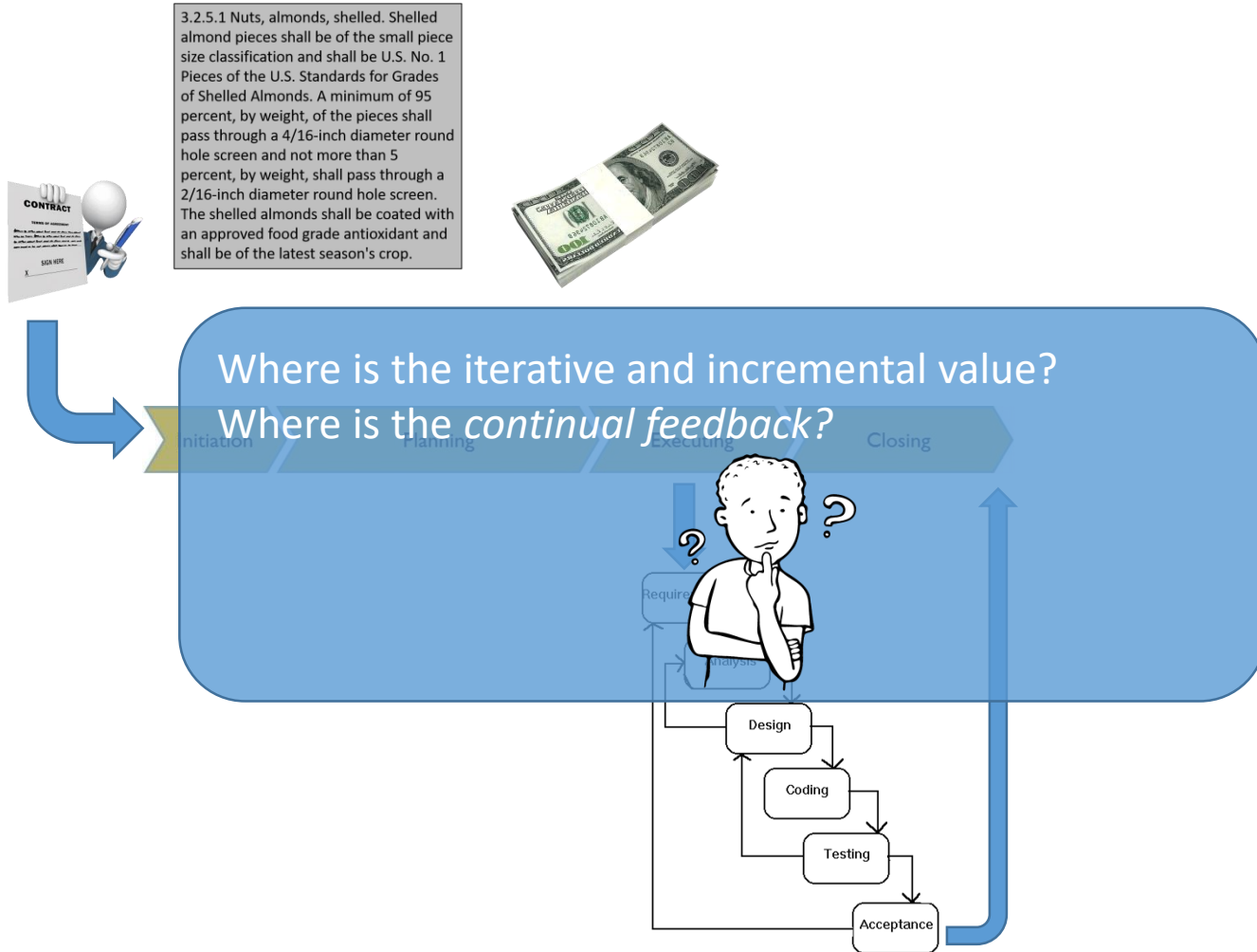


Approach: Develop by Phase

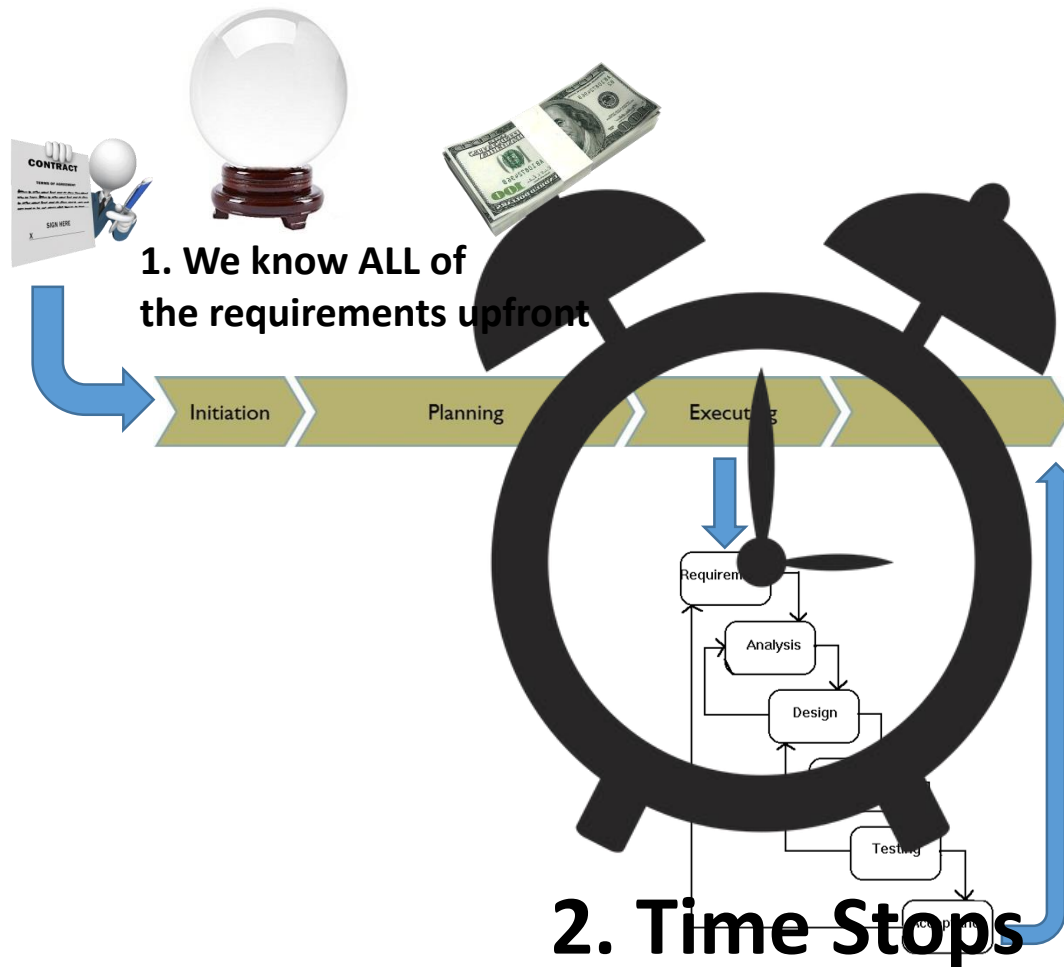
Success: Conformance to Specifications



Perfect Alignment of Traditional Models



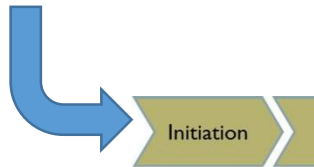
Required Assumptions (Traditional Model)



The average ACAT I development programs develop schedules for **five years**, lasting from Milestones B to C. (DSB, 2018)

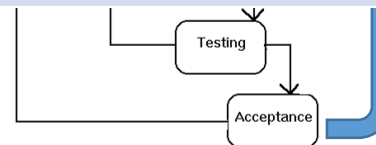
Cell Phone Example

June 1, 2013
Galaxy S4 active



	Galaxy S4 Active
OS	Android 4.4
Processor	1.9 GHz Quad-Core (4-cores)
Storage	Up to 64GB
RAM	2GB
Display	5 Inches (1920 x 1080)
Sensors	Multi-touch capacitive touchscreen proximity sensor
Battery	10 hrs video playback

January 1, 2018
(17 months later)

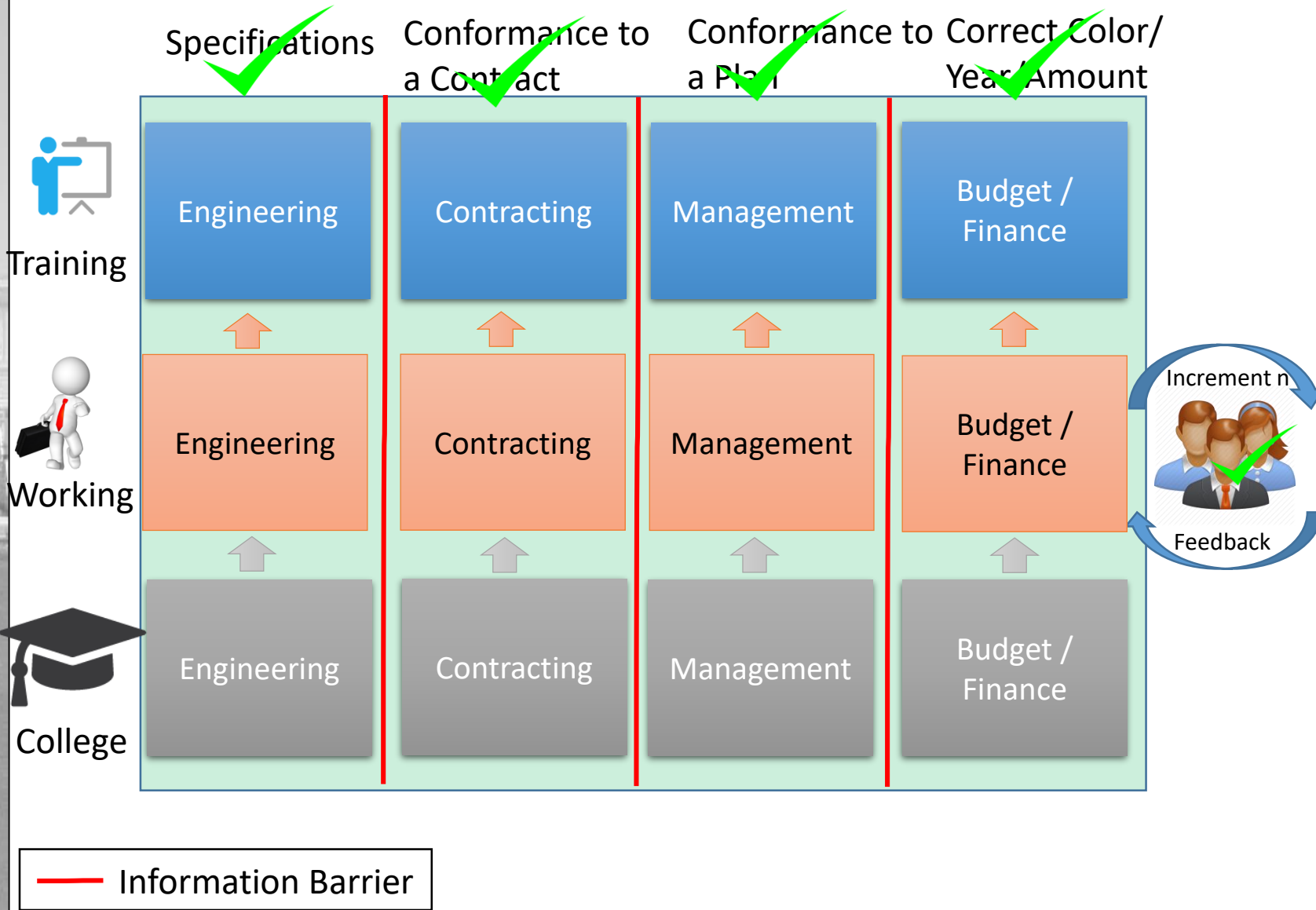


The average ACAT I development programs develop schedules for **five years**, lasting from Milestones B to C. (DSB, 2018)

Results

	Galaxy S4 Active	Galaxy S8 Plus
OS	Android 4.4	Android 8.0
Processor	1.9 GHz Quad-Core (4-cores)	2.35GHz Quad + 1.9GHz Quad (8-cores)
Storage	Up to 64GB	Up to 256GB
RAM	2GB	4 GB
Display	5 Inches (1920 x 1080)	6.2 inches (2960x1440)
Sensors	Multi-touch capacitive touchscreen proximity sensor	Proximity sensor Accelerometer Barometer Geomagnetic sensor Gyro sensor HR sensor Light sensor Iris sensor Pressure sensor Fingerprint sensor Hall sensor
Battery	10 hrs video playback	18 hrs video playback

Agile Changes How “We” Define Value





Example Agile Ecosystem (Contracting)

Contracting Requirements

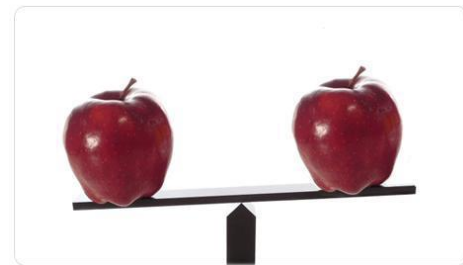
- Operate and maintain a system-of-systems, comprised of over 90 servers, geographically distributed databases, and 14* applications (desktop and web based) that support the agencies core mission
 - The systems are tightly coupled, in that an update to one system may require complimentary updates to 1+ other systems
 - Contain highly sensitive data including personally identifiable information (PII) and range from legacy (15+ years old) applications/architectures and new applications/architectures (< 5-years new)



* 4 Applications Selected for New Contract Model

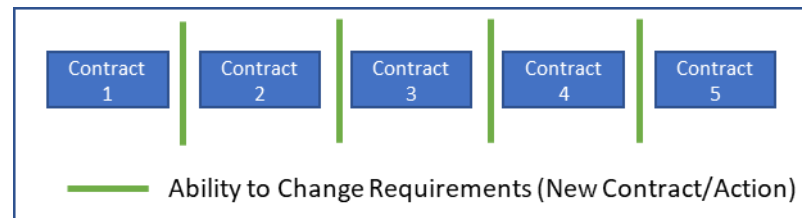
Contract Background

- Executed through a series of iterations on a BPA over a 2-year period
 - Total Award \$13M
- All development was completed by the vendor
- All contracts required the vendor to conform to the Scrum Process (Backlogs, Sprint planning, etc.)
- All orders were executed with the same:
 - Systems
 - Federal Employees
 - Vendor (4 of 5 Iterations)



Progression of Contracting Actions

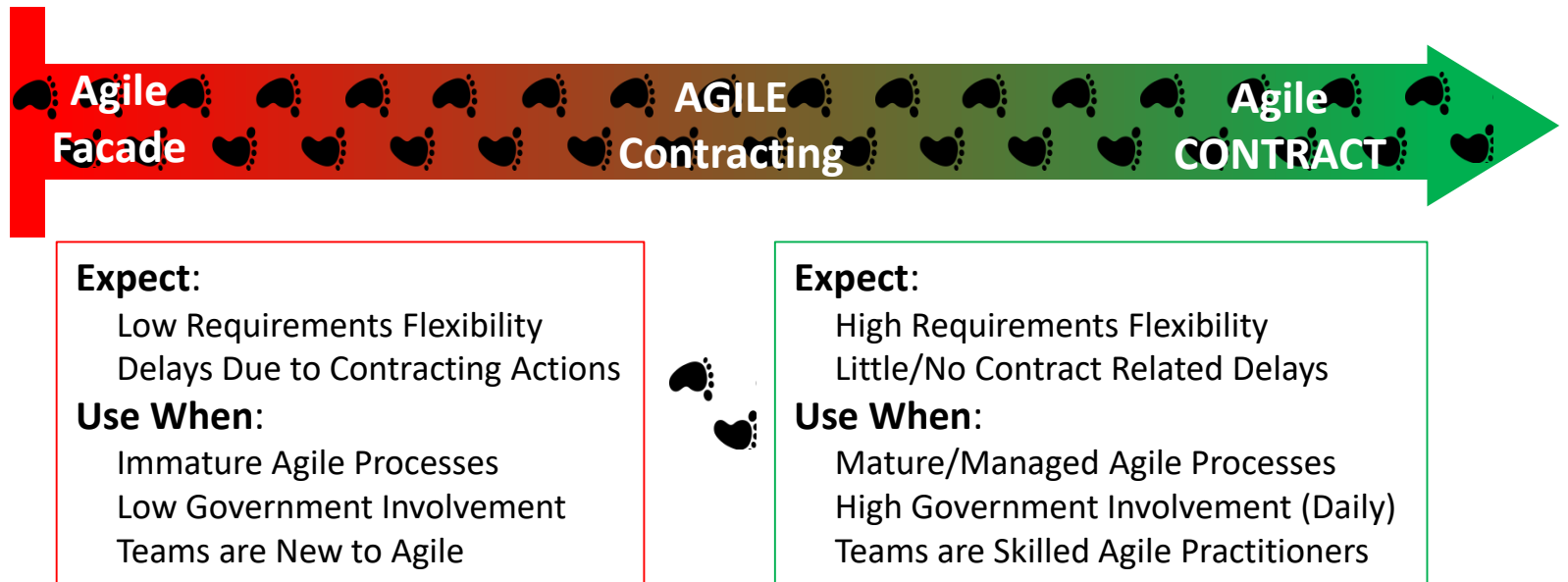
- **Agile Facade:** Remove traditional terminology (PM, Requirements, etc.) and add agile terminology (Scrum Master, User Stories, etc.)
- **AGILE contracting:** Let multiple short contracts/actions to fulfil a given capability



- **Agile CONTRACT:** Provide freedom within a given contract to change requirements



Agile Contracting Journey



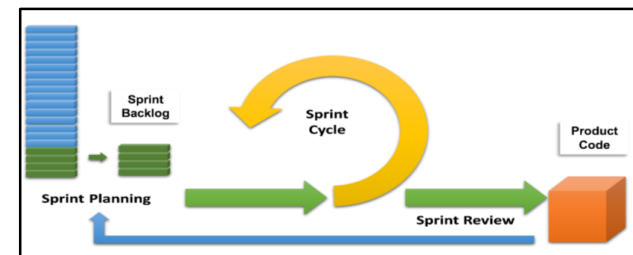
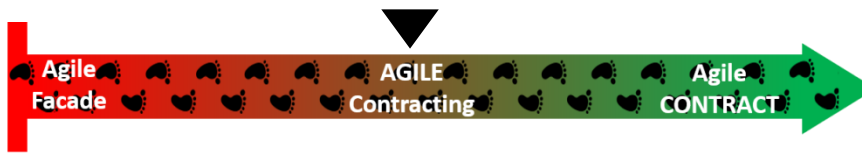
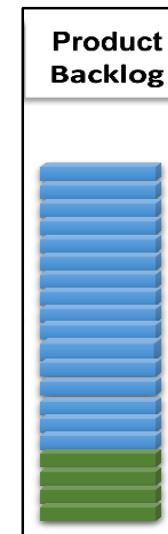
FFP - Release

- Requirement: Upgrade a large legacy application to be 508 compliant in one release. The deliverables were fixed at contract start so there was no flexibility after contract award
- Key Facts:
 - Cost: \$1.2M
 - Duration: 9-Months
 - Contract Modifications: 1



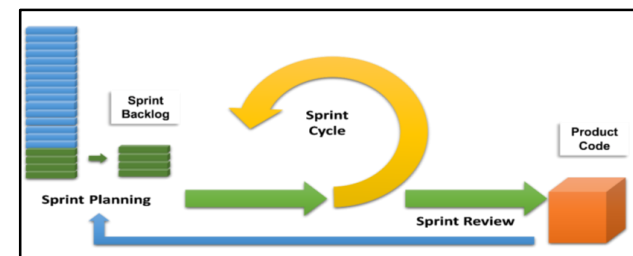
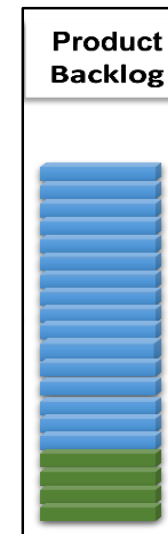
FFP – User Story

- Requirement: Develop a fixed set of User Stories for a software release. The government could determine NOT to execute a user story (provided work had not started) but could not add user stories
- Key Facts:
 - Total Cost: \$234,419.84
 - Low User Story: \$850.82
 - High User Story: \$71,314.08
 - Contract Modifications: 1



FFP – User Story (Exchangeable)

- Requirement: Develop a fixed number of user stories over the course of the contract
- This was rolled into a larger CLIN so accurately calculating the cost is not possible
- Key Facts:
 - Cost: \$N/A
 - Low User Story: N/A
 - High User Story: N/A
 - Contract Modifications: N/A



FFP – Complexity Levels

- Requirement: Develop user stories based on contractually defined complexity levels until the “not to exceed” (NTE) amount was reached or additional funds were applied
- The PWS contained complexity levels using “Representative User Stories” and when new backlog items (requirements) arose, the new requirement(s) were assigned a complexity level at the contracted cost
- Key Facts:
 - Complexity Levels
 - Low: \$3,300.00
 - Medium: \$9,300.00
 - High: \$14,500.00
 - Very High: \$22,000.00



FFP – Complexity Levels v2

- Requirement: Develop user stories based on contractually defined complexity levels until the “not to exceed” (NTE) amount was reached or additional funds were applied
- The PWS contained complexity levels using “Representative User Stories” and when new backlog items (requirements) arose, the new requirement(s) were assigned a complexity level at the contracted cost
- Key Facts:
 - **Complexity Levels**
 - Extra Low: \$2,205
 - Low: \$3,383
 - Medium: \$9,532
 - High: \$14,863
 - Very High: \$22,550 ▼



FFP – Teams

- Requirement: Supply agile teams to **deliver value** within contractually defined technical constraints
- Initial contract cost was 10% less than the previous approach for the same capacity
- Teams are required to be cross-functional
 - Each team member was required to have a minimum of two skill sets (Developer and tester, Technical writer and business analyst, etc.)
 - Specific skillsets were required per team but the vendor proposed the overall team structure(s)



Benefits of the Team Approach

- Enables stable teams
 - 2 x as Productive
- Enables multidisciplinary teams
- Little contract overhead to start a new team
- Manage at the team level versus people (LH) level
- Low contract monitoring overhead, the focus is shifted to helping deliver value



Success Factors - Contracting

- Communicate and educate the CO, legal counsel, and contract specialist
- Allow the flexibility (contract type) and time for transition between the two approaches
 - Do not transition to agile in a “day”, allow for flexibility



Success Factors – PM / Engineering

- Modify Existing Engineering Processes
- Change Reporting/Metrics (How and What is Reported)
- Engage in multiple levels of training
- Realign staff and Change Existing Roles
 - Project Manager
 - Schedulers
 - COR
- Add New Roles
 - Product Owner
 - Scrum Master
 - Agile Coach
- Many, Many, More



A faded, wavy graphic of the United States flag, showing the stars and stripes, positioned behind the text.

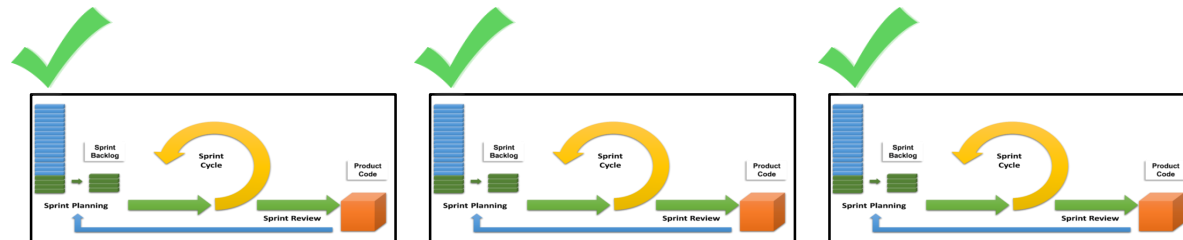
Measuring Value

Measuring Value

- Traditional: Value is defined at contract award



- Agile: Value is selected/defined by the Product Owner (PO) prior to each Sprint

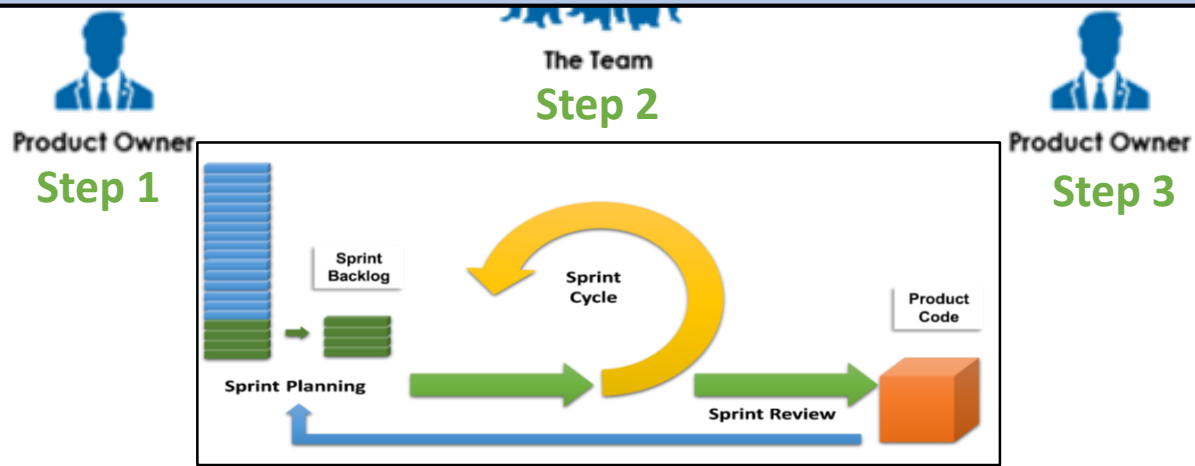


Measuring Value per Sprint

- Step 1: The Product Owner (PO) determines the highest priority user stories from the Backlog and defines Acceptance Criteria for the Sprint

Three typical outcomes at the Sprint Review:

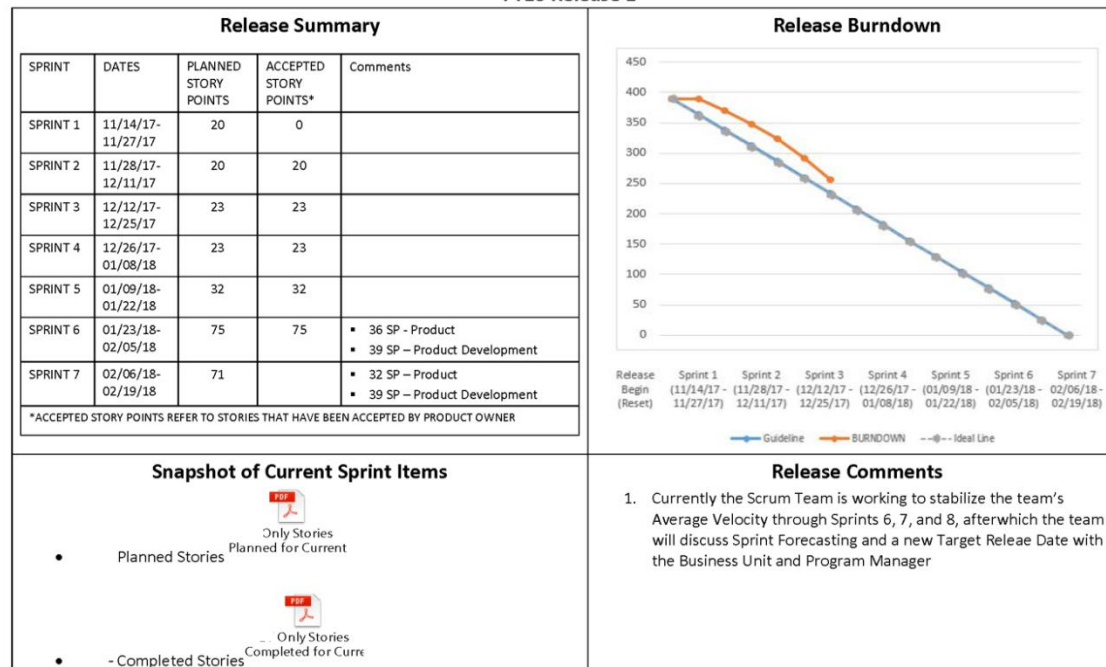
- 1) The user story is accepted by the PO as it meets the acceptance criteria
- 2) The user story is rejected by the PO because it DOES NOT MEET the acceptance criteria specified at the start of the sprint and this may be noted as a vendor performance (quality) issue
- 3) The user story is rejected by the PO but MEETS the acceptance criteria which does NOT reflect on the vendor performance since this was a requirements specification issue (Rare).

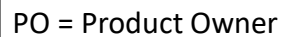


Increased Transparency

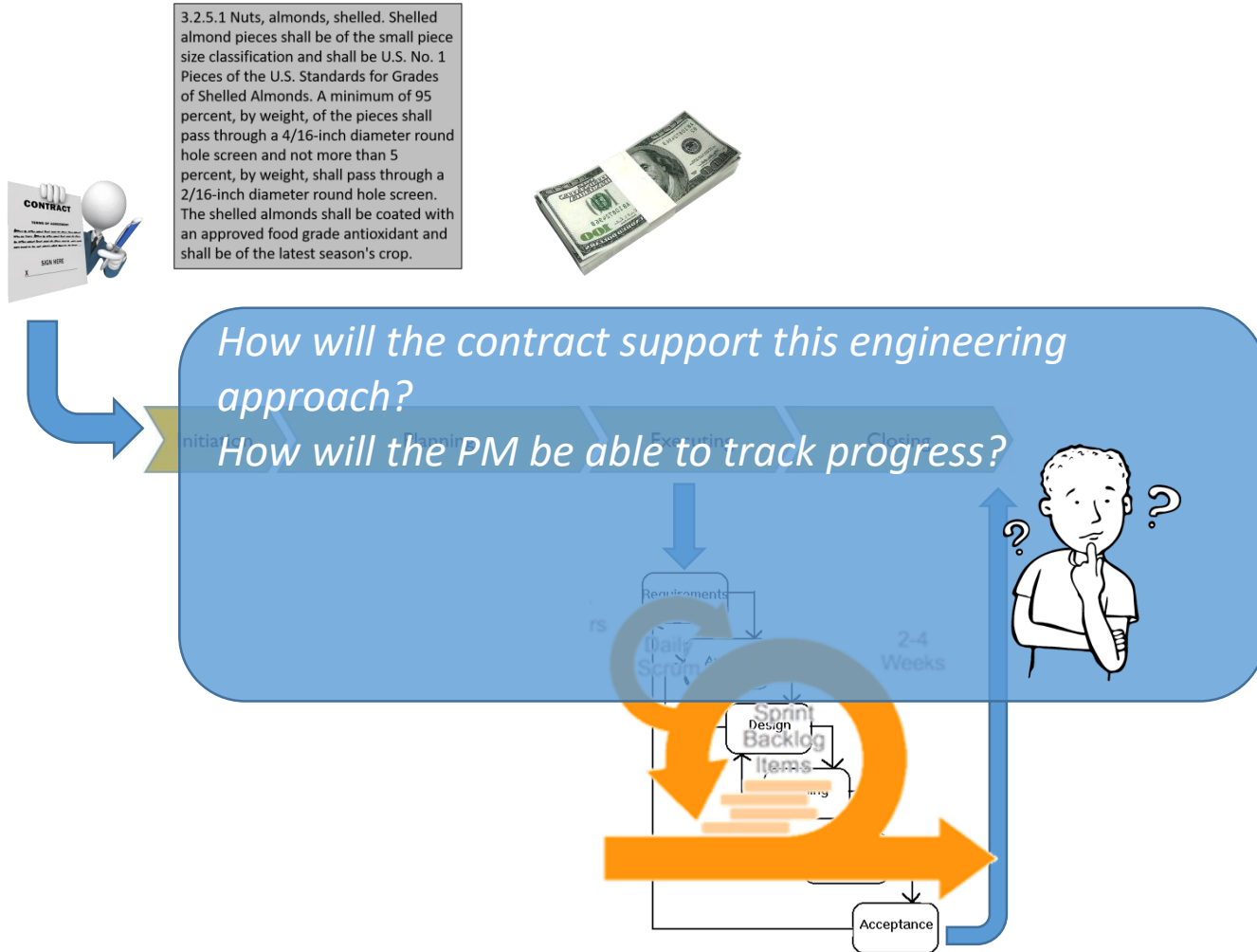
- The delivered value is measured every Sprint (2-weeks)
- Complete transparency into the work being performed

[Application Name]
FY18 Release 1

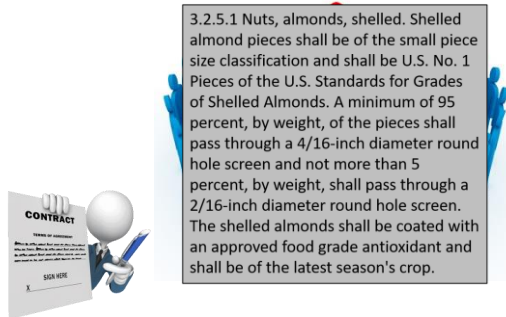




Risk of Only Changing One Piece of the Ecosystem



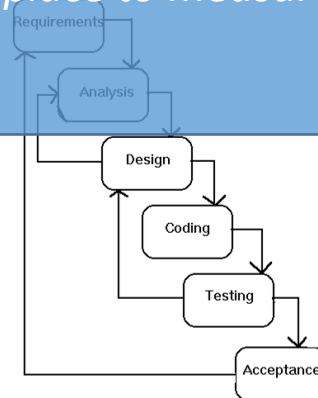
Risk of Only Changing One Piece of the Ecosystem



How will the traditional PM track the progress without specific deliverables?

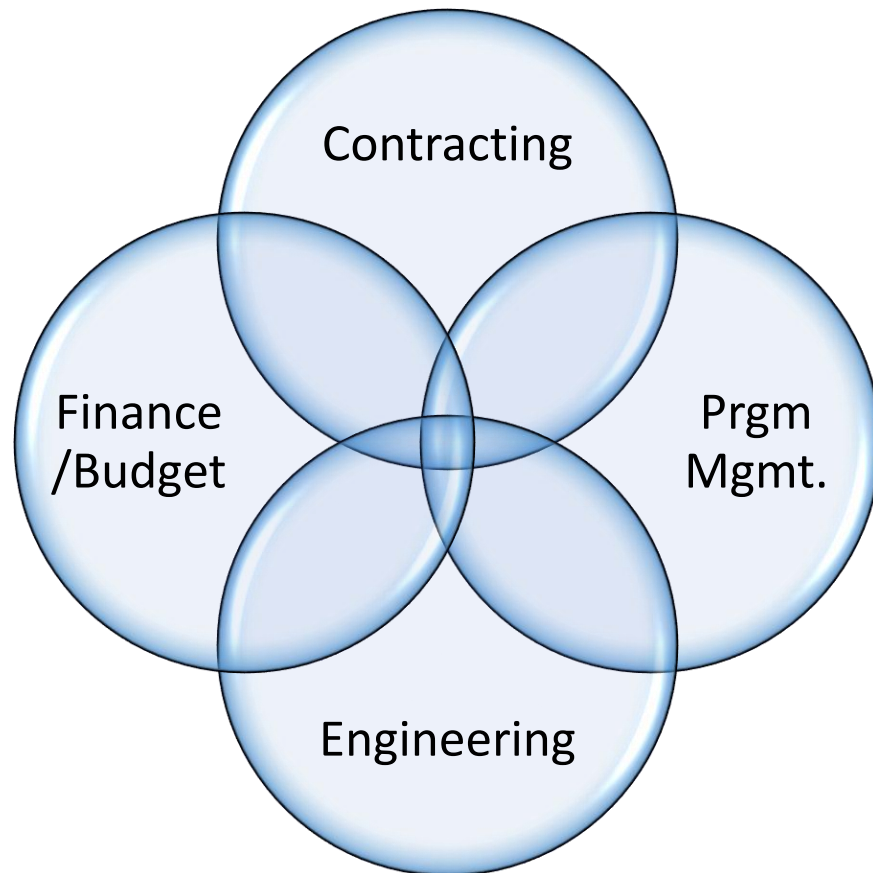
How will the traditional engineering process ensure value is being delivered based on user feedback?

What processes are in place to measure value?



Ecosystem

- The entire ecosystem needs to continually work together to enable an effective agile acquisition!







Makoto P. Braxton

- Makoto P. Braxton is the Division Chief and Chief Contracting Officer of the Assistant Secretary for Preparedness and Response (ASPR) Support Division within the Office of Acquisitions Management, Contracts and Grants. The ASPR Support Division provides contracting support in response to national emergency declarations under the authority of the Robert T. Stafford Disaster Relief and Emergency Assistance Act. The ASPR Support Division also provides operational contracting support to the entire ASPR organization, including the Office of Emergency Management and the Biomedical Advanced Research and Development Authority, among others
- Makoto has over 12 years of contracting experience, 9 of which have been with the Federal Government. Previously, Makoto has worked for the Department of the Air Force, the Department of the Army, and the Office of the Comptroller of the Currency (within the Department of the Treasury). Makoto holds a Bachelor of Science in Business Administration from the University of Arizona and is Level III Certified in Contracting in accordance with the Defense Acquisition Workforce Improvement Act, as well as Federal Acquisition Certification in Contracting Level III Certified



Matthew R. Kennedy, PhD

- Matthew R. Kennedy is a Senior IT Program Manager and Contracting Officer Representative (COR) at the Office of the Comptroller of the Currency (OCC). Formerly, Matt was a Program Manager at the Army's Program Executive Office - Enterprise Information Systems (PEO-EIS) and was a Professor of Software Engineering at Defense Acquisition University (DAU) where he specialized in agile acquisition. Matt served as the Associate Director of Engineering at the National Cancer Institute's Center for Biomedical Informatics and Information Technology and served in the U.S. Air Force as a network intelligence analyst. He has worked both inside and outside of the government on various IT projects over the last 18 years
- Matthew holds a Bachelors in Computer Science, and a masters and PhD in Computer Science and Software Engineering from Auburn University. He is Defense Acquisition Workforce Improvement Act (DAWIA) Level III certified in Program Management, Systems Engineering, and Information Technology (IT)



Contact: emailmatthewkennedy@gmail.com